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## ABSTRACT

### **A Study of the Effect of Music Genre and Intensity on Ethnic Menu Item Selection on a Military Dining Facility**

by  
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Restaurateurs spend millions of dollars yearly in the design, building, and renovations to their establishments. Nonetheless, very little time is spent focusing on the sales atmosphere that impacts customers purchasing behavior. In many cases, atmosphere has a greater influence over consumers' purchase decisions than the product itself. One of the most easily and inexpensively adjusted element of the atmosphere is music.

The purpose of this study is to determine the effects of music genre and intensity on patrons' ethnic menu item selection of a military dining facility in the Southwestern United States. The extent to which ethnic music could influence associated ethnic menu items was examined.

Three research questions were formulated to address this issue. The first question asked if specific ethnic music genre significantly affects patrons' selection of an associated ethnic menu item in a military dining facility. The second research question examined whether specific levels of music intensity of an ethnic music genre significantly effect patrons' selection of an associated ethnic menu item in a military

dining facility. The final research question focused on the demographic traits of patrons. Did customers' demographics significantly affect their ethnic menu item selection? All three questions were analyzed using multinomial regression analysis.

The experiment was conducted during the lunch meal at a military dining facility. Two ethnic meals, Italian and Mexican, were available for purchase during lunch. The ethnic music was then randomly played at two intensities – low and medium – over a period of six days. On patrons' first visit they were asked to complete a brief survey. On subsequent visits, only their entrée selections were tracked. The survey was composed of questions about food preferences and demographics.

The presence of ethnic music had a significant impact on the selection of ethnic entrées, but not the associated ethnic entree. Specific levels of music intensity of an ethnic genre were also found to have a significant impact on ethnic menu item selection, but not on the associated ethnic entree. Finally, several moderating variables – age, gender, and general feelings for the ethnic meals – significantly affected the relationship between music genre and intensity on ethnic menu item selection.

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A STUDY OF THE EFFECT OF MUSIC GENRE AND INTENSITY  
ON ETHNIC MENU ITEM SELECTION IN A  
MILITARY DINING FACILITY

by

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The opinions and conclusions in this paper are those of the author and are not intended to represent the official position of the DOD, USAF, or any other government agency.



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## ABSTRACT

### **A Study of the Effect of Music Genre and Intensity on Ethnic Menu Item Selection on a Military Dining Facility**

by  
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Restaurateurs spend millions of dollars yearly in the design, building, and renovations to their establishments. Nonetheless, very little time is spent focusing on the sales atmosphere that impacts customers purchasing behavior. In many cases, atmosphere has a greater influence over consumers' purchase decisions than the product itself. One of the most easily and inexpensively adjusted element of the atmosphere is music.

The purpose of this study is to determine the effects of music genre and intensity on patrons' ethnic menu item selection of a military dining facility in the Southwestern United States. The extent to which ethnic music could influence associated ethnic menu items was examined.

Three research questions were formulated to address this issue. The first question asked if specific ethnic music genre significantly affects patrons' selection of an associated ethnic menu item in a military dining facility. The second research question examined whether specific levels of music intensity of an ethnic music genre significantly effect patrons' selection of an associated ethnic menu item in a military

dining facility. The final research question focused on the demographic traits of patrons. Did customers' demographics significantly affect their ethnic menu item selection? All three questions were analyzed using multinomial regression analysis.

The experiment was conducted during the lunch meal at a military dining facility. Two ethnic meals, Italian and Mexican, were available for purchase during lunch. The ethnic music was then randomly played at two intensities – low and medium – over a period of six days. On patrons' first visit they were asked to complete a brief survey. On subsequent visits, only their entrée selections were tracked. The survey was composed of questions about food preferences and demographics.

The presence of ethnic music had a significant impact on the selection of ethnic entrées, but not the associated ethnic entree. Specific levels of music intensity of an ethnic genre were also found to have a significant impact on ethnic menu item selection, but not on the associated ethnic entree. Finally, several moderating variables – age, gender, and general feelings for the ethnic meals – significantly affected the relationship between music genre and intensity on ethnic menu item selection.

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## CHAPTER I

### THE PROBLEM AND ITS PURPOSE

#### Introduction

Atmosphere is an all-encompassing term that describes experience that is “felt” rather than seen. Sometimes the place – or more specifically its atmosphere – can have a greater influence on the customer than the actual product when making purchase decisions (Milliman, 1986). The atmosphere is experienced through the senses and can be described in terms of dimensions of the senses. The four dimensions as described by Kotler (1974) are visual (color, brightness, size, shape), aural (volume, pitch), olfactory (scent, freshness) and tactile (softness, smoothness, temperature). The fifth sense, taste, is not included because atmosphere cannot be tasted. However, certain parts of an atmosphere can rejuvenate memories of tastes.

Two important distinctions must be made between intended and perceived atmosphere when discussing this topic. Intended atmosphere is the set of sensory qualities that the designer of the artificial environment chooses to fill a space. The perceived atmosphere, however, may vary from customer to customer (Kotler, 1974). Peoples' personalities and experiences shape their perceived atmosphere. The goal of the designer is to create a match between the intended and perceived atmosphere. "The more dissimilar the customers of a particular establishment, the more varied their perceptions of a given intended atmosphere" (Kotler, 1974, p. 52).

Atmospherics is the term used to describe the intentional designing of the buying environment to create certain emotional effects in customers and stimulate perceptual and emotional responses by customers which affect their purchasing behavior (Kotler, 1974; Yalch & Spangenberg, 1990). It is a highly relevant marketing tool for retailers and a somewhat less relevant tool for manufacturers and wholesalers. This is mainly due to the limited amount of control wholesalers and manufacturers have over the retail environments where their final products are sold. Further, when the differences between establishments are small, buyers need further discriminative criteria, and atmospherics is one of the main tools used in an attempt to capture a specific segment of the market (Kotler, 1974).

According to Kotler (1974), atmosphere can be used to affect purchase behavior in three ways: as attention-creating medium, message-creating medium, and affect-creating medium. Retailers use color, noise, and motion as attention-creators to make an establishment stand out among competitors. The atmosphere serves as a message-creating medium when vendors use it to communicate information about their establishment to customers. Finally, the retailer may use affect-creating mediums to arouse visceral reactions that contribute to the increase in purchase behavior by patrons. Affect-creating mediums include the use of color, sound, and texture in the environment.

The atmosphere is composed of many factors; some are within the control of the manager (lighting, furnishings, architecture, temperature, music, color), and some are uncontrollable (weather, personalities, other customers) (Bitner, 1992; Booms & Bitner, 1980; Milliman, 1982; Yalch & Spangenberg, 1990). Of the factors that make up the atmosphere, the most frequently used atmospheric factor is music (Milliman, 1982; Yalch

& Spangenberg, 1990). Music can be adjusted to be fast or slow, loud or soft, vocal or instrumental. The music genre can also be adjusted (Milliman, 1986).

Environment-behavior relationships are studied by those in the growing discipline of environmental psychology. The relationships between the environment and consumer behavior have been studied in work (Oldham & Cummings, 1996), residential (Morgan & Stewart, 1999), entertainment (Orr & Myles, 1998), and institutional (Schroeder-Sheker, 1994) environments. Little of their attention has been focused on the foodservice industry (Baker et al., 1992; Donovan & Rossiter, 1982; North & Hargreaves, 1998). Most of the current research focuses on the retail sales environment.

Managers' past decisions to use background music in the retail sales environment have been based merely on intuition or folklore rather than strong empirical results (Milliman, 1982). Research in the retail sales environment has determined that music can change consumers' behavior. Behavior is effected through their shopping speed, average spending, propensity to return, appreciation of the establishment, willingness to pay higher prices, item selection, and perceptions of activity level (Areni & Kim, 1993; Bitner, 1992; North, Hargreaves & McKendrick, 1999; Milliman, 1986; 1986). This research has been beneficial to the retail sales environment, enabling managers to enhance their sales environment to increase their profitability through customer loyalty, catering to their target market, and an improved store image.

Further research on duplicating these effects in the foodservice industry will also be beneficial. Managers will have empirical research available on which to base their background music decisions. If the effects of music can be duplicated in the foodservice industry, music may enable managers to predict menu item sales more accurately,

increase sales of an item that was over-purchased or at the end of its shelf life. Music may also be used to extend customers stay or increase table turnover. Music may be used to create a specific restaurant image and give it a competitive edge.

According to a 1979 unpublished study, foodservice managers do not make their background music selections based on research. The study surveyed retail store manager's perceptions of the effects of background music on their customers' purchasing decisions. Of all managers surveyed, 100% stated their beliefs about the effects of music on their patrons were not based on actual data or research (cited in Milliman, 1982). There have not been any recent studies conducted on manager's music selection decision making.

### Problem Statement

More awareness by foodservice managers is needed to better utilize music as an influencing factor on their patrons' purchasing choices. As a response to the limited research in the area of atmospherics in foodservice discussed above, this research will determine how music genres and intensity effect customer menu selection.

### Purpose of the Study

The purpose of this study is to determine the effects of music on patrons in the foodservice industry. This study will provide managers with information when selecting their background music and not leave that decision to chance. This experiment will focus on the effect of music genre and intensity on menu item selection in a military dining facility located in the Southwestern United States. The results obtained from this



experiment will increase the small amount of literature available to assist foodservice managers who make background music selections in the foodservice industry.

### Research Questions

1. Does a specific ethnic music genre significantly effect patrons' selection of an associated ethnic menu item in a military dining facility?
2. Do specific levels of music intensity of an ethnic music genre significantly affect patrons' selection of an associated ethnic menu item in a military dining facility?
3. Are there any demographic traits of patrons that significantly affect their ethnic menu item selection?

### Significance of Study

An increasingly noticeable feature of music in everyday life is its use in commercial and leisure settings such as bars, restaurants, and shops. Research is warranted in these contexts due to the large sums of money involved (North et al., 1999). For example, depending on the situation and the objective of the establishment, a manager can use music to increase sales intensity, adjust customer throughput, and create return customers (Milliman, 1982). This study will be of significant value to foodservice managers desiring to have more control over their patrons purchasing decisions through menu item selection.

## Definitions

Atmosphere – the whole mass of air surrounding the earth; a surrounding influence or environment (Merriam-Webster Dictionary, 2000)

Atmospherics – "the conscious designing of space to create certain effects in buyers" (Kotler, 1974, p. 50); the creation of a particular mood or attitude by intentional features, events, or statements (Dictionary.com, 2000)

Background Music – quieter music (Milliman, 1982)

Basic Daily Food Allowance – a prescribed quantity of food defined by components, and monetary value, which is required to provide a nutritionally acceptable diet for one person for one day. The basic daily food allowance is computed using the Department of Defense Food Cost Index (Army Dictionary, 2000)

Behavior – the conduct or actions of customers based on stimulus

Consumers / customers / patrons – persons visiting the eating establishment with the purpose to consume food or beverage

Foreground Music – louder music (Milliman, 1982)

Low Intensity Music – 60 – 65 decibels

Medium Intensity Music – 80 – 85 decibels

Mexican Music – includes Salsa and Tropical Latin selections; determined by the focus group

Music Genre – the style of the music; Italian or Mexican (Latin and Salsa) as determined by the focus group

"Piped-in" music – music that is played throughout the restaurants over the sound system

Servicescapes – consciously designed places to create commercially important actions (Arnould, Price, & Tierney, 1998)

### Delimitations

The population of the study consists of meal card and paying customers at a dining facility located on a military installation in the Southwestern United States. The government pays meal card customers' meals. The primary customers are Air Force enlisted members of all ranks and a few officers. Therefore, the results of the study cannot be generalized to these operations. The subjects voluntarily participated in the study, however, only 1% of customers refused to participate in the study. The reason for not participating in the study was stated as lack of time or lack of desire.

The researcher selected the ethnic music and associated entrées that would be available for the experiment. Mexican and Italian music and entrées were selected. The researcher also selected the military dining facility as the location of the experiment. The experiment was limited to six days by the researcher.

For repeat customers, the Hawthorn effect might have been present. Repeat customers may have figured out that every time they eat at the facility while the survey was taking place, either Mexican or Latin music was being played, they might have eaten accordingly. This might have exaggerated the significance of music on menu item selection.

## CHAPTER II

### REVIEW OF LITERATURE

#### Introduction

Although no one knows the true beginnings of the food service industry, historians have been on the lookout for signs of the hospitality enterprise as it has happened through the centuries. Historians believe the first "snack bars" sprang up along new military and commercial highways of the expanding Roman Empire sometime between 405 BC and AD 200. These "snack bars" can be compared to modern day "fast food" establishments (Lane & Dupre, 1997).

As time has passed, the foodservice industry has grown into providing more than simply food. The foodservice establishments today are expected to provide good food and an appropriate atmosphere. On a typical day in 1998, 46% of all adults were restaurant patrons, and 21% of U.S. households used some form of takeout or delivery. According to the National Restaurant Association Pocket Factbook (2000), Americans are eating out more and more and the foodservice industry must keep up with this trend. A considerable amount of research has been done on the effect of music on retail sales (Areni & Kim, 1993; Sirgy, Grewal, & Mangleburg, 2000; Yalch & Spangenberg, 1990). However, there is limited research on the foodservice industry, which is reviewed below.

## Foodservice Industry Segments

The foodservice industry includes three major segments: commercial, institutional, and military. The commercial segment is composed of profit-oriented companies. Institutional and military are both part of noncommercial foodservice. The institutional segment includes those facilities that operate on a break-even basis (Stefanelli, 1997). Finally, the military segment includes military food service, post and Base Exchange food service organizations, military clubs, and military healthcare units (Powers, 1992).

### Air Force Foodservice

"All branches of the military, during peaceful times or war, have to deal with daunting conditions - remote locations, unfriendly natives, and low or no natural resources. Military foodservice is based on determination, imagination and innovation" (Anonymous, 1997, p. 98). This research will focus on military food service in the Air Force.

Air Force foodservice became its own entity in 1947 when they split from the Army. At this time Air Force troops were served in antiquated mess halls with straight-line serving lines and large, open dining areas using picnic tables and metal trays. With the implementation of the joint Armed Forces Recipe Service, Air Force foodservice became more standardized and implemented its own Worldwide Menu and Standard Recipes. These publications ensured consistent quality meals were served at every base. The Air Force took a stride towards meeting commercial standards when they implemented "a la carte" pricing in 1978. The 1980s brought about the "scatter line"

concept that placed food stations islands throughout the serving area to enhance the customers' experience (Anonymous, 1997).

The military today is an all-voluntary force; therefore, foodservice expectations are high. Military members expect an environment similar to a modern commercial environment, not a wartime "chow hall". Because the Air Force dining facility is the primary eating establishment for many active duty members, it is imperative the facility managers provide an atmosphere that is not cold and institutional, but similar to that of commercial dining facilities. The military has responded through updated interiors and dynamic foodservice facilities (Anonymous, 1997). "Armed-forces dining facilities now offer fast food, takeout service, specialty bars and commercial-genre decor, because today's military personnel expect more than the typical mess-hall fare" (Hedden, 1997).

The main customers of the Air Force dining facilities are active duty military personnel. The Air Force rank structure has two divisions: enlisted and officer. The enlisted ranks begin at the level of airman basic (E1) to airman (E2) to an airman first class (E3) and last to a senior airman (E4). At this point airman are promoted to the next level and become noncommissioned officers: staff sergeant (E5), technical sergeant (E6), and master sergeant (E7). The highest level is comprised of senior noncommissioned officers: senior master sergeant (E8) and chief master sergeant (E9). Officers, regardless of rank, outrank all enlisted members.

#### Air Force Foodservice Operation

The Air Force is required to follow certain standards in their foodservice operations; the Air Force Services Agency governs these standards. The Air Force Worldwide Menu (WWM) is the basis for any menu item in any Air Force foodservice

operation. The WWM is nutritionally balanced and was designed so managers can operate within the Basic Daily Food Allowance. The WWM can be revised in order to satisfy the preferences of customers due to documentation, accommodation of religious observances, the adding of ethnic or specialty meals, and increasing menu variety (Air Force Services Agency, 2000). Documentation is found in the form of customer comment cards, surveys, or focus groups.

Another important standard that must be followed is the 2% monetary standard. All military foodservice operations are not allowed to have a profit or a loss of more than 2% over their earned income. This standard was enacted to ensure the meal card – or subsistence-in-kind (SIK) customer – is given their full entitlement. Because of these rigid standards, the ability to affect consumers' purchase behavior of certain menu items can have a direct impact on a facility's bottom line. The managers may be able to predict sales and also promote certain menu items to ensure the 2% standard is upheld (Air Force Services Agency [Online]).

The Air Force spends hundreds of thousands of dollars yearly in making improvements to their foodservice facilities that are dedicated providing meals to active duty members. The design improvements are beginning to include the environment. More and more facilities now offer their customers background music and televisions. However, these design improvements are not supported by research.

### Environment

Retailers spend millions of dollars each year designing, building, and refurbishing stores. Millions more are spent hiring, training, and compensating employees that

interact with retail customers. Yet retailers do not generally engage in systematic research that enables them to determine the appropriate mix of environmental factors that may influence the patronage decision. (Baker, Grewal, & Levy, 1992, p. 445)

“The number of investigations addressing the influence of music on consumer behavior is still rather small” (Areni & Kim, 1993, p. 336). Past decisions to use background music in the retail environment have generally been based more on intuition or folklore rather than strong empirical results (Milliman, 1982). In an unpublished study conducted in 1979, 52 managers of retail stores were surveyed. Of these managers, 76% expressed the “belief” that their customers purchased more as a result of background music and 82% felt the music played had a positive effect upon the customers’ mood. The same managers were then asked if their beliefs were based on actual research; the response was a unanimous “no” or “not that I know of.” The same study asked 560 customers if they preferred stores that played music, 70% replied they did. Additionally, 63% stated they “purchased more” or “probably purchased more” while background music was playing (cited in Milliman, 1982). This study showed how managers’ attitudes or beliefs were turned into assumptions about the behavior of their customers. These assumptions were accurate for those involved in the study, but empirical research may enable managers to fine tune their use of background music to further enhance it’s effects.

On the basis of a review of diverse literature by Bitner (1992), three composite dimensions were identified as being particularly relevant to the servicescape or the sales environment: ambient conditions, spatial layout and functionality, and signs, symbols,



and artifacts. "Ambient conditions include background characteristics of the environment such as temperature, lighting, noise, music and scent. As a general rule, ambient conditions affect the five senses" (Bitner, 1992, p. 67). Spatial layout refers to the ways machinery, equipment, and furnishings are arranged as well as the size and shape of those items and their spatial relationships. Functionality is the ability of those same items to facilitate performance and goal accomplishment. Finally, signs, symbols, and artifacts serve as distinct or implied signals that communicate about the place to its users (Bitner, 1992). Baker, Grewal, and Levy (1992) also include social cues as a dimension that affects the sales environment. Social cues are the number and friendliness of employees. The ability of the physical environment to influence behaviors and to create an image is particularly apparent for service businesses such as hotels, restaurants, professional offices, banks, retail stores and hospitals (Kotler, 1973; Booms & Bitner, 1992; Bitner, 1992). The physical environment provides cues to the consumer about the firm's capabilities and quality; it may also influence the customer's ultimate satisfaction with the service provided (Bitner, 1992).

### Atmospherics

The effect of atmospherics or physical design and décor elements, on consumers and workers is recognized by managers and mentioned in virtually all marketing, retailing, and organizational behavior texts. Yet, particularly in marketing, there is a surprising lack of empirical research or theoretically based frameworks addressing the role of physical surroundings in consumption settings. Managers continually plan, build, change, and control an organization's physical

surroundings, but frequently the impact of a specific design or design change on ultimate users of the facility is not fully understood. (Bitner, 1992, p. 57)

An individual's response to an environment often depends on situational factors as well, such as his purpose for being in that environment (Alpert & Alpert, 1989; Bitner, 1992). Atmospherics is also referred to as spatial aesthetics (Milliman, 1986). Environment-behavior relationships are studied by those in the growing discipline of environmental psychology. These relationships have been studied in work, residential, entertainment, and institutional environments. Little of their attention has been focused on the retail environment or the foodservice industry (Baker et al., 1992; Donovan & Rossiter, 1982; North & Hargreaves, 1998).

#### Marketing with Atmospherics

Atmospherics is a relevant marketing tool mainly in situations where the product is purchased or consumed and where the seller has design options. Atmospherics is not as relevant for manufacturers and wholesalers because they have little control of the environment where the final goods are purchased. Kotler (1974) proposes that atmospherics are important for four reasons. When planning the role that atmospherics will play in an establishment, four questions must be asked.

1. Who is the target market?
2. What is the target market seeking from the buying experience?
3. Will the resulting atmosphere compete successfully with competitors' atmospherics?

4. What atmospherics variables can fortify the attitudes and emotional responses the buyers are seeking? (Kotler, 1973-1974).

First, the manager needs to determine who their target market is. For example, restaurants catering to scene-conscious Generation Xers have moved disk jockeys from the dance floor into the dining room, cranked up the intensity and picked up the beat (Peterson, 1997). In contrast, a grocery store may play vintage Motown, telling the customer, "You belong here. You, Ms. 1973 Graduate, are the target customer for today" (Bartek, 2000). Second, atmospherics becomes more relevant as a marketing tool as the number of competitive outlets increase (Kotler, 1974). In this case, atmospherics becomes one of the chief tools for attempting to attract and keep a specific market segment. For example, Generation X restaurants play "ear-splitting techno that keeps out the frumpy over 30 crowd" (Peterson, 1997, B1).

A third reason atmospherics are important is because they are more relevant to marketing in industries where product and/or price differences are slight. In this case, buyers need further discriminative criteria, such as locational convenience, parking facilities, owner personality and atmosphere. For example, Zagat Survey LLC – publisher of the popular restaurant guides – said the company is considering adding a fifth ratings category which will gauge a restaurant's noise level (Peterson, 1997). Finally, atmospherics is a more relevant marketing tool when products are aimed at specific a social class or lifestyle buyer groups. For example, stores appealing to upper-class patrons are usually laid out more spaciouly and display less goods, whereas stores appealing to youth might use moving lights, rock music, and bright colors. Answering

these questions will enable the manager to make better background music choices for his patrons, which has been proven to ultimately affect the stores profitability.

### Atmospheric Stimuli

According to Berman and Evans (1995), atmospheric stimuli or elements can be divided into four categories.

1. The exterior of the store (i.e. exterior signs, entrances, parking availability)
2. The store's general interior (i.e. lighting, music, scents, color schemes)
3. The layout and design variables (i.e. waiting rooms, furniture, dead areas)
4. The point of purchase and decoration variables (i.e. product displays, artwork)

Turley and Milliman (2000) include the human variable as a fifth element based upon their findings from the literature. The human variable includes employee characteristics and uniforms, crowding, customer characteristics, and privacy. These categories were developed in order to organize those stimuli, which influence consumer behavior (Berman & Evans, 1995). This classification system was designed to assist managers in identifying and tailoring their atmosphere to create the environment to a particular market and to create a desired response from shoppers (Turley & Milliman, 2000).

### Physical Environment

The physical environment can be very effective as a marketing tool for service firms because the "products" or services they offer have many intangible characteristics,

and they are produced and consumed simultaneously (Bitner, 1992; Booms & Bitner, 1982; Milliman, 1986). Services differ from traditional products because the customer is present when a service is produced and consumed, and the potential impact of the total environment can sharply influence the customer's behavior. According to Bitner (1992), all of the environmental elements must remain consistent with the service firm's image, recognize the impact small environmental changes can have on customer perceptions, and reinforce positive feelings in target markets and reduce potential negative responses. Research has shown atmospheric cues effect the image of a store and the patrons' image of a store. Certain types of music (i.e. classical), lighting (i.e. soft), and fixtures (i.e. antique) are likely to create an image of an upscale store with wealthy patrons (Sirgy, Grewal, & Mangleburg, 2000). The environment must also be designed to stimulate approach behavior. Approach behaviors are positive behaviors that might be directed towards a particular place (Bitner, 1992; Mehrabian & Russell, 1974; Wakefield & Baker, 1998).

One of the challenges in designing environments to improve individual approach behaviors and encourage appropriate social interactions is that the optimum design for one individual or group may be different for another (Bitner, 1992). The actual effects of a store's atmosphere on consumers' shopping behavior have not been well documented. Retailers claim significant effects from the manipulation of the store atmosphere (e.g. layout, lighting, color and music), but this evidence is purely interpretive (Donovan & Rossiter, 1982). The most commonly used atmospheric factor in enhancing the delivery of service to customers is music (Yalch & Spangenberg, 1990).

## Music and Behavior

Research has shown that music has an influence over consumers' response to advertising (Alpert & Alpert, 1990; Gorn, 1982; Kellaris & Cox 1989; MacInnis & Park, 1991) as well as to the retail environment (Dube, Chebat, & Morin, 1995; Milliman, 1982; 1986; Yalch & Spangenberg, 1990). Consumers' awareness of music as an aesthetic product has also been explored (Anand & Holbrook, 1985; Kellaris, 1992). Findings include changes in consumers' mood, attitude toward the brand, purchase intention, and behavior.

Music has been used in consumer behavior research, as well as communications, psychology, and music therapy research to determine its effects on behavior, preference, and mood. Research investigating music effects may be divided into those that analyzed and/or manipulated structural and sound elements of music and those that did not.

"Structural elements refer to the properties making up musical sound such as melody, rhythm, harmony, major and minor modality, dynamics, and tempo" (Alpert & Alpert, 1989, p. 486)

Mood is a fleeting, temporary feeling or state that is usually not intense (Gardner, 1985), and "has an impact on attitudes and behavior" (Alpert & Alpert, 1990, p. 110). For example, environments that produce positive feelings are likely to be ones where people want to spend time and money (Donovan & Rossiter, 1982; Mehrabian & Russell, 1974), where unpleasant environments are avoided (Mehrabian & Russell, 1974). In general – according to Gardner (1985) – mood states also appear to prejudice evaluations and judgements in mood congruent directions. In a study on music influences on mood by Alpert and Alpert (1990), a clear pattern emerged between purchase intention and

background music. Sad greeting cards were significantly more likely to be selected when sad background music was playing than those with happy music or no music. Alpert and Alpert (1990) determined the respondents, who were college students, felt more inclined to send greeting cards to distant friends and relatives when hearing sad emotional music.

The changes in behavior include items such as amount of money spent, items purchased, and time spent shopping. "Time is an important factor in retailing because retailers strongly believe in a simple correlation between time spent shopping and amount purchased" (Yalch & Spangenberg, 2000). Time perception may be influenced by internal states induced by external stimuli such as music (Kellaris & Mantel, 1994). Noise that is too loud may cause physical discomfort, extreme temperatures may cause people to shiver or perspire, the air quality may cause breathing difficulty, and poor lighting may decrease the ability to see and cause physical pain. These physical responses may directly effect whether or not people stay in and enjoy a particular environment (Bitner, 1992). Hui, Dube and Chebat (1997) concluded that:

in the context of waiting, music does not act as a distracter to reduce perceived wait duration, but operates through induction and transfer of mood and emotion. A piece of music may increase perceived wait duration but it may still be an effective tool to minimize any negative consequences of waiting. (p. 104)

Milliman's (1982) study of supermarket shoppers suggests that slow tempo instrumental music can significantly slow the pace of in-store traffic flow, as opposed to fast tempo. The results showed customers spent 38% more time in the store when exposed to the slower music. An earlier study by Smith and Curnow (1966) reported

customers spent less time in a supermarket while listening to loud background music compared to soft background music. In a later study by Milliman (1986), slow tempo instrumental background music showed diners stayed longer and consumed more alcoholic beverages than when fast tempo instrumental music was used. In some retail settings, the purpose of music may be to slow customer movement, keeping people in the store for as long as possible in an attempt to encourage increased purchase behavior. However, in other settings, the purpose of music may be the opposite, that is, to move customers along as a way of increasing sales intensity.

A restaurant, for instance, will most likely want to speed people up, especially during lunch, when the objective is to maximize the "number of seats turned" in a very short period of time, normally about two hours or less. Playing slow tempo music in a restaurant might result in fewer seats turned and a lower profit, although it could encourage return visits if customers preferred a relaxed luncheon atmosphere. (p. 91)

Robally et al (1995) and McElrea and Standing (1992) examined the effects of music tempo on eating behavior. There were three music conditions: slow-tempo music, fast-tempo music, and no music. Each subject was observed under each of the three music conditions. The results confirmed that music significantly affected eating and drinking speed. "The sizable effect of music tempo noted here has obvious implications for the consumption of alcohol in public places" (McElrea & Standing, 1992).

Milliman (1986) studied the effect music has on the food service industry and focused on the influence of background music on the behavior of restaurant patrons. The



results revealed that the tempo of the background music was significant. Customers tended to stay longer and their average ticket was larger. The number of entrée purchases were not affected by the tempo of the background music because it is socially acceptable for individuals to eat only one entrée. However it is quite acceptable to consume one or more alcoholic beverages (Milliman, 1986). This study isolated background music as an atmospheric variable that affected the atmosphere of a restaurant. In relating the study to the Mehrabian-Russell model, Milliman (1986) concluded the slower – perhaps more soothing background music – created a more relaxing environment (greater approach condition).

"A number of studies, emerging mostly from clinical psychology, have found that the presence of background music influences how people interact with one another" (Dube et al., 1995). Early studies on verbal interaction found that the presence, in comparison to the absence, of background music increases verbal exchange and affiliative behaviors such as smiles and eye contact (Dollins, 1956). This increased communication relates to the approach behavior that firms must create in order to stimulate purchase behavior.

Clinical psychologists divide background music into two categories, soothing or sedative and stimulating. In this line of research, soothing music features a slower tempo and is associated with high positive emotions and low anxiety, whereas stimulating music is characterized by a faster tempo and a higher level of anxiety and arousal (Dube et al., 1995). Anand and Holbrook (1990) also found that moderate tempo induced more positive affective responses. Both music genres selected for this research were moderate tempo, therefore ruling out any purchasing behavior changes due to varying tempos.

Studying the relationship between the physiological and the psychological responses to music is psychophysiology. A 1947 study by Dreher found musically trained subjects showed a relationship between physiological responses (galvanic skin response) and mood (see Radocy & Boyle, 1997). Van Stone (1960) studied possible mood differences associated with tone quality of music. Results indicated there were no significant differences between three types of ensembles (string, woodwind, and brass), the mood response was not effected by change in tone. This finding is important because the tone differences between the selected music genres should not effect mood responses of the customers. However, liking of a music selection can effect the customers mood (Hargreaves, 1986).

#### Negative Effects of Background Music

“While potentially useful in helping to define and/or reinforce a particular image, music can just as easily offend patrons” (Herrington & Capella, 1996, p. 37). For example, while Indian raga music is helpful in creating an atmosphere for an Indian restaurant, many American diners may find this type of music annoying which detracts from the dining experience (1996). An alternative would be to play ethnic compositions mixed with more popular tunes known to please a particular market segment (1996). In a study by d’Astous (2000), a statistically significant relationship between age and loud background music was found. The results of the eleven additional shopping irritants in relation to age were not statistically significant.

### Music Intensity

"A setting in which music is encountered but frequently is not attended to is that of a restaurant or cafeteria" (Roballey, et al. 1985). Few studies have been conducted in this environment. In these studies the researchers analyzed very different variables that are effected by "piped-in" music. Also, music intensity was not evaluated in the foodservice studies. However, music intensity has been evaluated in a variety of retail environment studies and these studies will be discussed.

Research supports the hypothesis that music intensity has an effect on patrons in the retail sales environment. In an attempt to explain the effect music intensity has on the retail sales environment, Yalch and Spangenberg (1990) studied the effects of store music on shopping behavior in the men's clothing section of a department store. This study compared the effects of background, foreground, and no music on department store shoppers. In-store interviews discovered a preference for foreground music, but customer's moods and hearing foreground music did not significantly enhance unintended purchases.

### Music Genre

Researchers have examined the effects genre of background music has on certain aspects of shopping behavior. It has been suggested that genre has a stronger effect on the perceptions and preferences of customers (Bruner, 1990). Since music genre preferences are strongly influenced by individual differences, varying the genre of a store's background music is likely to produce various effects across consumer groups (Areni & Kim, 1993; MacInnis & Park, 1991).

North and Hargreaves (1998) conducted a study in a university cafeteria, which employed a no music control group and three experimental groups. The experimental groups were exposed to three music genres: contemporary British pop, classical music, and easy listening. The subjects were asked to provide estimates of the maximum amount of money they would spend on a list of menu items as well as rate their perceptions of the cafeteria. The results "provided clear evidence that different musical genres (and no music) influenced subjects' perceptions of the cafeteria" (p. 2263). The music genre also had a profound impact on the price customers stated they would be willing to pay for items (1998).

Muzak, a "piped-in" music company, held an experiment at a major department store. They played adult contemporary, environmental, and no music all at various times of the day. Through exit interviews, researchers found that when music matched the shoppers' demographic groups, they shopped an average of 18% longer and made 17% more purchases. In using these results, a store should "piped-in" adult contemporary music during the morning and then switch to Top-Forty when the teenage groups come in after school.

Aware of the various effects music genre can produce, Areni and Kim (1993) attempted to identify the music that best fit the context of examining, tasting, and purchasing wine. In their study, they varied the background music between classical music and Top-Forty music genres in a wine cellar. "Background music did influence the amount of money shoppers spent with classical music producing a higher level of sales than top Top-Forty music" (p. 338). Yalch and Spangenberg (1990) also suggest that retailers desiring to convey a high prestige and high price appearance should

consider background music. "If customers are seeking sophistication, then in-store cues must suggest, and even facilitate that experience. The same holds for other sought shopping experiences like excitement, relaxation, etc." (Areni & Kim, 1993, p. 338). In agreement with the cafeteria study by Areni and Kim (1993), North and Hargreaves (1998) found "classical music led to total maximum price estimates that were significantly higher than those stated in either the easy-listening or the no-music conditions" (p. 2265). Areni and Kim (1993), Yalch and Spangenberg (1990), and researchers at Muzak all agree that research supports the need to play different types of music for different demographic groups as their target customer population (Miller, 1991).

North et al. (1997) went even further and determined that musical fit has a profound influence on an associated product choice. Two distinctly different music genres were used in a supermarket setting to study the affects of music on wine selection. German and French music was varied to determine the effects the music had on their wine selection. French wine outsold German wine when French music was played whereas German wine outsold French when German music was played, despite an overall bias in favor of French over German wine sales. However, the questionnaire responses indicated customers were not aware of the effect that music had on their selections.

### Moderating Variables

Age and gender of customers have been the two demographic variables that have consistently been linked to behaviors associated with background music.

"Customers' time perceptions of their shopping time varied with the type of music, depending on their age" (Yalch & Spangenberg, 1990, p.55). Younger shoppers (24 and under) reported they spent more time shopping when exposed to background music whereas older shoppers (25 and older) spent more time shopping to the foreground music. The study suggests "that choosing to play store music solely to satisfy customer's preferences may not be the optimal approach but rather music should be varied across areas of a store that appeal to different-aged customers" (p. 55).

Gender was selected as a factor based on reviewed research. Konechni (1982) found evidence to suggest that responses to music can be moderated by the characteristics of the listener. In Myers-Levy's (1988) review of consumer research literature, gender was found to explain consumers' judgements. D'Astous (2000) and Kellaris and Rice (1993) found that women were significantly more effected than men in the presence of loud in-store music. Females attributed more positive qualities to lower intensity music, the findings for males was not significant.

#### Mehrabian-Russell Model

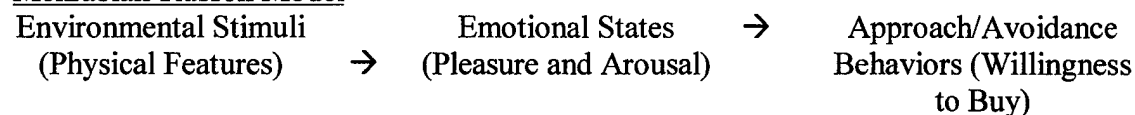
The Mehrabian-Russell Model is a widely used theoretical model in studying the effects of store atmosphere on shopping behavior. The M-R Model is an adaptation of the S-O-R Paradigm. The Stimulus-Organism-Response Paradigm offers a "parsimonious description of environments, intervening variables and behaviors relevant to the retail setting" (Donovan & Rossiter, 1982, p. 36). It relates features of the environment (stimulus) that causes a consumer's evaluation (O) and then causes approach-avoidance behaviors (response) within the environment (Donovan et al, 1994;

Turley & Milliman, 2000). The Mehrabian-Russell Model was created from the S-O-R Paradigm.

The Mehrabian-Russell (M-R) Model (see Table 1) explains how individuals react to places with two general and opposite forms of behavior: approach and avoidance (Mehrabian and Russell, 1974). Approach behaviors are positive behaviors that might be directed towards a particular place, such as the desire to stay, exploring an unfamiliar environment, and affiliating with others in the environment through verbal communication and eye contact. Avoidance behaviors are the opposite of approach behaviors. These behaviors can be described as a desire to get out of an environment, a tendency to avoid interacting with the environment or remain inanimate in the environment and avoiding interaction with others in the environment (Bitner, 1992; Mehrabian & Russell, 1974; Wakefield & Baker, 1998).

Table 1: Mehrabian-Russell Model

Mehrabian-Russell Model



“These approach-avoidance behaviors can be grouped into four categories based on the type of behavior: time, exploration, communication and satisfaction” (Yalch & Spangenberg, 2000, p. 142). Time relates to the physical desire to stay or leave an environment, to shop or not to shop at the store. It can also be related to the time spent in the store shopping. Exploration relates to the willingness to explore the environment, or

how much of the store area is covered by each customer. Communication is the willingness to communicate with the other people in the environment, which is especially important in the retail sales environment. Finally, satisfaction relates to the ability of customers to find the items they want, a minimal wait in line, and ease of transporting the purchased items to their transportation (2000). A limitation of the Mehrabian-Russell model is the lack of a classification system of specific environmental features or environmental stimuli (Baker et al., 1992).

The decision to purchase is considered a component of approach behavior; service firms should strive to create an environment that evokes approach behavior from their potential customers (Bitner, 1992). Approach behaviors in retail settings are influenced by perceptions of the environment (Donovan & Rossiter, 1982). For example, in an attempt to drive away the youthful market segment that was damaging the store's image, "elevator music" was played by a 7-11 storeowner (Bitner, 1992). The 7-11 is not the only place that sends musical messages. Some stores in the malls blast music only teenagers can tolerate. The older generation sees this musical choice as saying to the customer, "we don't have clothes that fit you, lady. If your ears can't stand to be here, you know these are not your racks" (Bartek, 2000, p. 23).

### Summary

Four studies demonstrate that background music can significantly affect the behavior of restaurant customers, however, there is room for considerable more research on this general topic (Milliman, 1986). According to North and Hargreaves (1998) and Milliman (1986), future research might consider a broader range of musical genres and



listening environments in an attempt to generalize the effects of music. Also, the effects of foreground music could be compared with background music in different types of foodservice environments. These issues could also be examined in terms of their effects upon various consumer groups (age, gender, etc.) in the foodservice industry. Overall, the available research in the foodservice industry is very limited and further research is required. Research has analyzed the significance of intensity and others have studied the responses to genre, however the interaction of the two has not been evaluated. This research will not only add to the available literature on atmospherics in foodservice, it will analyze the significance of intensity and genre on the consumer. Music intensity and genre, as well as demographics of customers, have all been proven to effect customers' behavior in other environments, but not in the foodservice environment.

## CHAPTER III

### METHODOLOGY

#### Introduction

Restaurateurs spend millions of dollars yearly in the design, building, and renovation of their establishments. Nonetheless, very little time is spent focusing on an appropriate mix of environmental factors that make up the sales atmosphere that impacts customers purchasing behavior. In many cases, atmosphere has a greater influence over consumers' purchase decisions than the product itself (Milliman, 1986). Of these, the most easily and inexpensively adjusted elements of the atmosphere is music. Music can be adjusted to be loud or soft and vary in genre or genre. Research in this area has already proven beneficial to the retail sales environment, and further research duplicating these effects in the foodservice industry may also be beneficial. This study was designed to determine the effects of music intensity and genre on patrons of a dining facility.

#### Purpose

The purpose of this study was to determine the effects of music genre and intensity on patrons in the foodservice industry. This study will provide managers with empirical information when selecting their background music and not leave that decision to chance. This experiment will focus on the effect of music genre and intensity on menu item selection in a military dining facility located in the Southwestern United States. The

results obtained from this experiment show whether or not there is a link between genre and intensity on ethnic entrée selection.

#### Research Questions

1. Does a specific ethnic music genre significantly affect patrons' selection of an associated ethnic menu item in a military dining facility?
2. Do specific levels of intensity of an ethnic music genre significantly affect patrons' selection of an associated ethnic menu item in a military dining facility?
3. Are there any moderating traits of patrons that significantly affect their ethnic menu item selection?

#### Evaluation

This section describes the assessment instrument and model used to evaluate the effect music genre and intensity has on consumers' purchase behavior. This evaluation will also introduce moderating variables: general feelings toward ethnic foods, the dining facility's preparation of ethnic foods, and frequency of visits to the dining facilities. General demographics are also considered.

#### Assessment Instrument

An informed consent cover letter was given to each respondent to complete (Appendix C) followed by a self-administered survey (Appendix D). The survey is composed of nine questions; one is open-ended, six are structured multiple choice, and two use a five-point Likert scale. Prior to the start of the experiment the Office of Sponsored Programs approved the survey (Appendix E).

The first question on the survey asks for the last four numbers of the customers' social security number (SSAN). This was used to tracking individual customers' entrée selection and enabled the researcher track return customers and to determine how their selection changed with changes in the music intensity and style. This tracking also made it possible for each customer to complete the survey one time during the course of the experiment, regardless of the number of visits.

The rest of the survey is composed of eight questions. Questions two and three asked the customers to measure their general liking of Italian and Mexican foods as well as their specific liking of the dining facility's preparation of these foods. Questions four and five focused on the customers' frequency of lunchtime visits to each of the installations military dining facilities. These questions were added upon request from the squadron's senior management. Questions six through nine focused on the demographics of the customers of the dining hall. The demographic characteristics were used to determine whether there are any demographic traits of patrons that significantly affect their ethnic menu item selection. Research has linked age and gender to approach and avoidance behaviors in the retail setting, this research will determine if there is also a link in entrée selection behavior.

The second type of survey used is an interview. Each customer of the dining facility will be requested to participate in this study over six different lunch periods (Appendix F). Not all customers were a part of the survey on all six experimental days. After the initial survey distribution, research assistants asked customers if they have previously completed the survey. If so, they will ask for the last four of their SSAN and mark their entrée selection on their data collection form through covert observation.

### Validation of Instrument

A focus group was used to validate both the research instrument and the type of music played. The focus group was conducted by the researcher and the committee chairman and was composed of the five active duty Air Force members; three officers and two non-commissioned officers, all involved with the management of the dining facilities at various levels.

First, the focus group listened to each music selection and determined whether the selection fell into the Italian or Mexican music genre (see Appendix G). Thirty music selections were evaluated; 13 were determined to be Italian, 12 were determined to be Mexican or Latin and five selections were not distinguishable enough as one specific genre and were rejected. The music selections were accepted or rejected based upon a unanimous vote.

Next, the focus group evaluated the informed consent and self-administered survey. The group did not find any unclear or ambiguous statements in either document. It was requested that two questions be added to the survey to provide additional information to the facility management. Questions six and ten were then added. A member of the group also requested a statement be added under question one to further ensure customers' confidentiality.

### Limitations

Some of the independent variables are correlated with each other. For example, the age of a customer was related to their rank. Also, the rank of a customer was related to whether or not they are a meal card holder. Therefore, the correlated variables would mask the significance of the variables during analysis.

The design of the interior of the dining facility had a slight Southwestern decor (Appendix B), which could have an influence over customers' selection of a Mexican entrée. Also, due to renovations, the facility had been closed three months and just opened three days prior to the start of the experiment. This could have an affect on the number of participants who were not aware the facility was open, although the opening of the facility was advertised base-wide.

The facility was only open for lunch for two hours Monday through Friday and closed on Saturday and Sunday. The menu items selected for the study are part of the Air Force's Worldwide Menu, which is required by the Air Force to be followed. The dining facility is required to offer both main entrée's and short order items; therefore not forcing the customers to select either Italian or Mexican entrées. The entrée selection was also limited by the size of the facility. Only two entrees were served for both Italian (lasagna and veal parmigiana) and Mexican (fajitas and enchiladas) menu items. It was also required that the short-order section of the dining facility remained open. A variety of sandwiches and grill items were available on each day of the experiment on the short-order side. It was required that all menu items were made from Air Force mandated recipe cards (Appendix A)

The intensity of the music could be no louder than 80-85 dB. This limitation was due to the need for the customers to communicate with the servers. Therefore, the decibel levels could not be exactly replicated from other studies (85-90 dB) (Kellaris & Rice, 1993). However, the noise created by the hoods over the grill created an area of the serving line where the music was not heard as clearly as on the rest of the line. This area of lower intensity music may have some effect on the customers menu item selection.

The researcher had no control over individuals' music preferences or cultural backgrounds. An ethnicity question was not included in the survey because of the sensitivity of the question. If the question was optional the responses would be unusable. Also, the question may be interpreted in a variety of ways. The patron may answer their heritage, or if they come from a "melting pot" family they may simply pick the ethnic background they associate with the most. Because of this variability, the ethnicity of the patrons was not addressed.

### Research Design and Method

#### Pre-Experiment Environment

Prior to the study the facility had been closed for renovations for three months. When the facility opened, it was only open for lunch Monday through Friday. Every Thursday an ethnic menu item was available as a special. The rest of the menu consisted of grill items, sandwiches, and another main entrée selection from the worldwide menu. Background music was not played in the facility at any time before the experiment began.

#### Procedures

The lunch period at the dining facility where the experiment took place lasts two hours (11:00am to 1:00pm); the lunch hours are called the experiment periods. There are six experiment periods. The experimental periods were separated by two and four days. Music was played during each period according to Appendix E. The playing of different music genres and intensities during certain experiment periods were randomly selected by randomly pulling numbers out of a hat. All customers involved only heard one genre and intensity of music from point of entry to point of purchase per experiment period. Before the start of the first experimental period decibel readings were taken at four

locations in the dining facility. The first reading was taken in the foyer, the other three were taken at various locations along the serving line (Appendix H). The low intensity fell within the range of 60-65 dB (A) and the medium intensity fell within the range of 80-85 dB (A). The decibel meter was calibrated before the start of the measurements. The decibel meter was calibrated before the intensity was measured. The calibration was measured at a variance of 0.6 dB. According to Dr. Michael Hall, PhD. (personal communication) this variance is not significant on the effect on customers' listening.

An informed consent cover letter (Appendix C), a survey (Appendix D), and pen was given to each individual upon exiting the cashier area of the dining facility. There were two registers in use during the lunch period. Each respondent was instructed to return their letter, survey, and pen to the table at the exit of the facility. A large candy dish filled with mints was located on the table by the exit as a thank you to those who completed the survey. After the first day of the experiment, if the customers had already completed the survey on a previous visit, they were considered repeat customers and were only asked to give the last four of their SSAN to the researcher. The researcher documented their entrée selection through covert observation.

A research assistant walking around the facility answered any questions from customers who were completing the survey. They also picked up any completed surveys. Three file boxes were located on a table near the exit of the dining facility. One box was labeled "completed surveys" and the second, "consent letters" and the third, "incomplete surveys". Those who chose not to complete the survey were asked to place it in the "incomplete survey" box to keep track of refusals. Daily, the surveys were banded



together and labeled with the appropriate music intensity and genre played that experimental period. The surveys were stored in a locked filing cabinet for safekeeping.

The experiment periods were conducted twice a week for three weeks. No Italian or Mexican entrées were served at anytime other than during the experiment periods. The non-ethnic or "other" entrées remained the same throughout the experiment periods. The researcher also documented whether customers ordered items from the snack line. Persons ordering side items and no main entrée were documented as ordering 'other'.

The customers were exposed to the background music for 30 seconds to three minutes before ordering their entrée (the time varies depending on the number of customers waiting in line). The average customer takes between three and five minutes to order their entrée, receive their entrée, and pay for their meal. As customers entered the serving line they had the choice of selecting a short order entrée or continuing on to the main entrée line. The ethnic meals were located on the main line. The set up of the line can be found in Appendix H.

Table 2: Entrées available on the During the Experiment

Italian Entrées	Veal Parmigiana Lasagna
Mexican Entrées	Fajitas Enchiladas
Non-Ethnic Entrées – "Other"	Hamburgers Hotdogs Tuna Melts Grilled Cheese Fried Chicken Club Sandwiches Turkey or Ham Sandwiches Bacon Lettuce and Tomato Sandwiches

The researcher and three research assistants were present to collect data on the first day of the experiment. This number was necessary due to the large number of customers who had to complete both the survey and the letter. It was necessary to follow the customers to their tables while explaining the research and survey to them in order not to slow down the cashier's line. Only two customers refused to complete the survey. Five customers completed the survey but refused to give their SSAN. These surveys were assigned a number and included as one-time customers. The eight customers (1%) refused to complete the survey.

The second day of the experiment included a large number of first time respondents. This was due primarily to the closure of the other military dining facility on the base. This was the only day the second dining facility was closed. The fourth and fifth days of the experiment were held during a base exercise. Therefore the number of participants was slightly lower than that expected. On the final day of the experiment

three of the repeat participants inquired about the significance of the music to the study since at no other time was music played in the facility, and the same genres of music were played.

Three comments were made to the researcher that focused on the Italian music and their participants dislike for that music. These negative comments were made when the music intensity was medium.

### Theoretical Model

The theoretical model used in this study is an adaptation of the Mehrabian-Russell (1974) Model (see Table 3). The environmental stimulus is music – a feature of the atmosphere. It is hypothesized that the ethnic music will produce an emotional response in the customers'. This emotional response may be based on moderating variables (experiences with the food items and demographics) will also affect the customers' responses. Finally, the customers' decide whether to purchase an associated ethnic meal.

Table 3. The Mehrabian-Russell Model and Adaptation

#### Mehrabian-Russell Model

Environmental Stimuli (Physical Features)	→	Emotional States (Pleasure and Arousal)	→	Approach/Avoidance Behaviors (Willingness to Buy)
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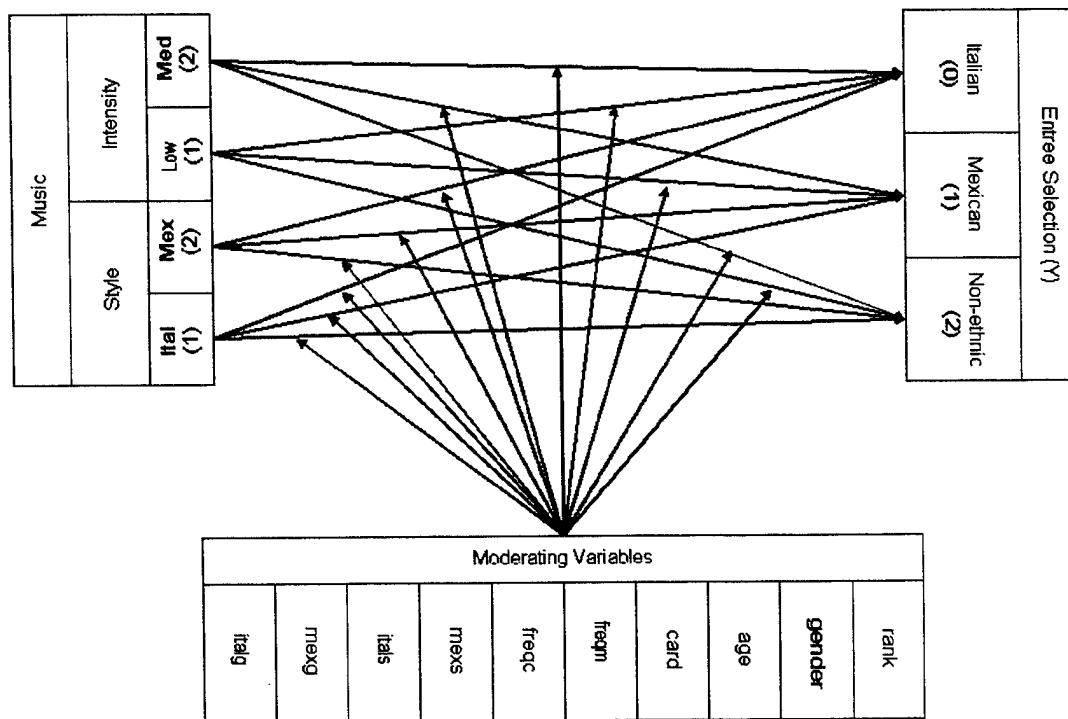
#### Researcher's Adaptation

Ethnic Music as the Environmental Stimulus (Atmospheric Feature )	→	Emotional Response to Stimuli (may be based on moderating variables)	→	Approach/Avoidance (Willingness to Purchase Ethnic Meals)
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Specifically, music is divided into intensity (low and medium) and genre (Italian and Mexican) (Figure 1). The music (independent variable) is played to determine if there is a response that effects their purchasing behavior. The customers menu item selection (Italian, Mexican, or other entrées) was then evaluated to determine whether any of the independent variables had a significant effect on their selections. Moderating variables may also affect their purchasing behavior. These variables include the general feelings toward Mexican food, general feelings toward Italian food, card holder status, age, gender, and rank.

### Experimental Design

The experimental design of this study was a quasi-experimental design. The experiment focused on the effect that music genre and intensity had on menu item selection (Figure 1). The experimental design variables are nominal, ordinal, and interval (see Table 4). The independent variables are music genre and music intensity. Music genre is categorized into Mexican and Italian genres. Music intensity is categorized into low (60-65dB), and medium (80-85 dB). The independent moderating variables are demographics and general feelings toward Italian and Mexican ethnic foods. The dependent variable is menu item selection. The ethnic main entrée menu items available for selection are Italian (lasagna and veal parmigiana), Mexican (enchiladas and fajitas) and the short order items (fried chicken, hamburgers and sandwiches).



**Figure 1:** Theoretical Model

The independent moderating variables in this study were chosen by a review of related literature on music's affect on retail sales and by feedback from the focus group as discussed in the literature review. The general feelings toward the ethnic foods and the specific feelings toward the facilities preparation of these foods allows the facility managers to empirically determine the preference for their food preparation compared to their overall ethnic food experience. The frequency of visits to each facility enables the facility managers to determine customer loyalty to each facility; this variable will not be used as part of the analysis. Whether or not a customer is a meal card holder shows whether the customer had as many options when choosing to eat at the dining facility as non-card holders. Meal card holders do not receive a subsistence allotment in their pay, where non-card holders do. This limits the amount of money they have available to

frequent other eating establishments. The rank variable in conjunction with the frequency of visits variable will enable the facility managers to determine the rank of the customers that frequent the experimental facility (Crosswinds) more often than the Mountain View dining facility.

Table 4. Dependent, Independent, and Moderating Variables and Descriptions

<b>Dependent Variable</b>	<b>Value or Category</b>	<b>Description</b>	<b>Used as Variable Type</b>
Entrée (Y)	Italian Mexican Non-ethnic ("other")	Lasagna or Veal Parmigiana Enchiladas or Fajitas Cold Sandwiches, Grill Items, and Fried Chicken	Nominal
<b>Independent Variables</b>			
Music Intensity (intensity)	No music Low Medium	0 dB (0); 60-65 dB (1); 80-85 dB (2)	Ordinal Factor
Music Genre (genre)	Italian (1) Latin (2)		Nominal Factor
<b>Moderating Variables</b>			
General Feelings for Italian Food (italg)	Binary Variable	Like (0); Not like (1)	Interval Factor
General Feelings for Mexican Food (mexg)	Binary Variable	Like (0); Not like (1)	Interval Factor
Feelings for Facility's Italian Food (itals)	Binary Variable	Like (0); Not like (1)	Interval Factor
Feelings for Facility's Mexican Food (mexs)	Binary Variable	Like (0); Not like (1)	Interval Factor
Freq of visits to Crosswinds Facility (freqc)	Estimated number of visits	0-1; 2-3; 4-5; 6-7	Ordinal Covariate
Freq of visits to Mountain View Facility (freqm)	Estimated number of visits	0-1; 2-3; 4-5; 6-7	Ordinal Covariate
Meal Card Holder (card)	Yes or No		Nominal Factor
Age (age)	Years old	18-23; 24-30; 31-37; 38 and older	Ordinal Covariate
Gender (gender)	Male or Female		Nominal Factor
Rank (rank)		E1-E4; E5-E6; E7-E9; Officer	Ordinal Covariate

### Statistical Analysis

Multinomial logistic regression was used to analyze the data. The model was originally designed to be a fixed effects model and use the ID (last four of the SSAN) as a random variable (Figure 2). This was not possible because the ID variable was not significant; this was determined through MIXNO software (Hedeker, 1999). The MIXNO software was developed by Donald Hedeker due to a lack of available software able to perform mixed effects nominal logistic regression analysis. After further consultation with KB Boomer, the lead researcher in statistical consulting at Pennsylvania State University, fixed effect multinomial logistic regression analysis was determined to be the best method to use. Boomer pointed out that since the demographic data and moderating variable responses (preferences for Italian or Mexican food) were simply duplicated by the researcher for each of the repeat customers, the ability to use repeated measures would be an error. The data that was duplicated from the initial surveys limited the researcher from truly analyzing change in preferences by only tracking item selection and not tracking change in preferences. Therefore, each observation was treated as an independent observation rather than as repeat visitors. Data was analyzed using both SPSS and Minitab software.

After consultation, the genre and intensity categories were adjusted by removing all responses in the control groups with no music and no genre. The analysis used a 2 X 2 model: low intensity, medium intensity, Italian and Mexican music. The mixed effects model only changes the  $\alpha_0$  from being the random term to being the overall mean. The  $\beta$  is the intercept that indicates how the overall mean preference varies with each response and the error is a measure of the variability among individuals.



$$\text{Logit (Y)} = (\beta_0 + \alpha_0) + \beta_1 \text{genre}_1 + \beta_2 \text{intensity}_2 + \beta_3 \text{mexg}_3 + \beta_4 \text{italg}_4 + \beta_5 \text{mexs}_5 + \beta_6 \text{itals}_6 + \beta_7 \text{freqc}_7 + \beta_8 \text{freqm}_8 + \beta_9 \text{card}_9 + \beta_{10} \text{age}_{10} + \beta_{11} \text{gender}_{11} + \beta_{12} \text{rank}_{12} + \varepsilon$$

Where:

Y = entrée selection = 0,1,2 (Italian, Mexican, other)

$\alpha_0$  = random term inducing correlation among repeat customers' entrée selections

$\beta_0$  = constant

Genre = music genre played = 1, 2 (Italian music, Mexican music)

Intensity = music intensity played = 1, 2 (low intensity, medium intensity)

mexg = general liking of Mexican food = 0, 1 (like, not like)

italg = general liking of Italian food = 0, 1 (like, not like)

mexs = specific liking of Mexican food = 0, 1 (like, not like)

itals = specific liking of Italian food = 0, 1 (like, not like)

freqc = ordinal measure response value for frequency of eating at Cross Winds

freqm = ordinal measure response value for frequency of eating at Mountain View

card = meal card holder = 1, 2 (yes, no)

age = ordinal measure response value for age of customer

gender = gender of customer = 1, 2 (male, female)

rank = ordinal measure response value for military rank of customer = 1, 2, 3, 4  
(E1-E4, E5-E6, E7-E9, Officer)

$\varepsilon$  = error term – all other two-way interactions and higher interactions

**Figure 2.:** Random Effects Multinomial Logistic Regression Model

### Excluded Participants

Eighteen participants were excluded from analysis due to their responses to their general liking of Mexican and Italian food. These individuals marked that they had never eaten Italian or Mexican food. It was determined these respondents did not have any experience with the ethnic foods to be involved in the study. These exclusions resulted in 834 responses to be included in the analysis. The usable response rate was 97.9%.

The responses to the Likert scale were collapsed into the binary variables – like (0) and not like (1) – for analysis. The age categories were also collapsed. Due to only 18 responses in the last age category, the last two categories (38-43 and 44+) were collapsed. When combined the category 4 included 60 individuals. Collapsing the age Likert scale category categories gave a sufficient number of responses.

## CHAPTER IV

### ANALYSIS AND INTERPRETATION OF THE DATA

#### Introduction

This study investigated the relationship between music genre and intensity on ethnic menu item selection. Three research questions were developed to address this relationship. Multinomial logistic regression was used to analyze the data. This chapter presents the results of the analysis of patrons' menu item selection. Further, moderating variables were analyzed to determine the degree to which they moderated the patrons menu item selection (Figure 1).

#### Pearson's Correlation

The survey included demographic variables that might be highly correlated: age, rank, and card. All of the moderating variables were analyzed for correlation using Pearson's Correlation analysis (Table 5). The variables rank and card were excluded because they were correlated at the  $\alpha=0.05$  significance level. Finally, frequency tables were run on the independent variables in order to determine the composition of the sample.

Table 5:  
Pearson's Correlation Matrix for Related Moderating Variables

	rank	gender	age
gender	C = 0.149; p < 0.000*		
age	C = 0.849; p < 0.000*	C = -0.170; p < 0.000*	
card	C = 0.688; p < 0.000*	C = -0.070; p < 0.044*	C = 0.732; p < 0.000*

\* Correlation (C) is significant at the  $\alpha=0.05$  level (2-tailed).

### Profile of the Participants

Eight hundred and fifty eight responses were collected over the six-day data collection period. Six responses were incomplete and therefore excluded from the survey and eighteen were excluded due to their never having eaten Mexican or Italian food. These exclusions resulted in 834 useable responses for the study. Four hundred eighty two of the customers completed the self-administered surveys; the rest of the three hundred and forty nine responses were repeat customers; 289 customers ate at the dining facility twice during the experiment, 94 ate three times, 56 ate four times, 28 ate five times and 15 ate six times (Figure 3).

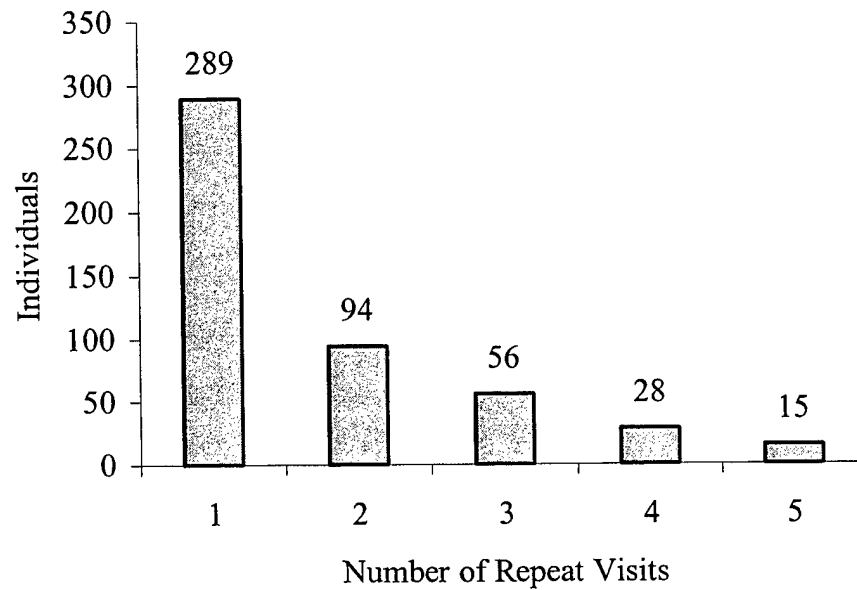


Figure 3. Number of Repeat Visits for Each of the Repeat Customers

Descriptive statistics were run using SPSS on each of the moderating variables.

Of the 482 participants 49.3 percent were card holders and 50.7 percent were not (Figure 4). The age of the participants fell in one of four categories, 51.8 percent of the participants were 18 to 23, while the remaining participants were 24 and older (Figure 5). The age distribution is similar to that of the Air Force where 43 percent of members are under the age of 26 (Air Force Personnel Center, 2000).

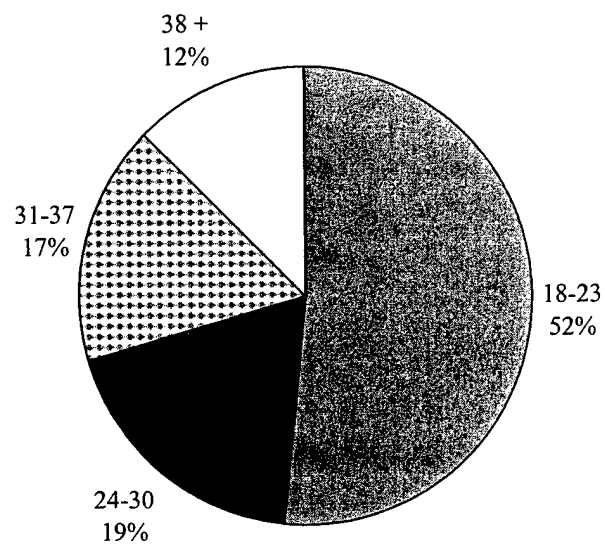


Figure 4: Percent of Participants Who Fell Within the Four Age Ranges

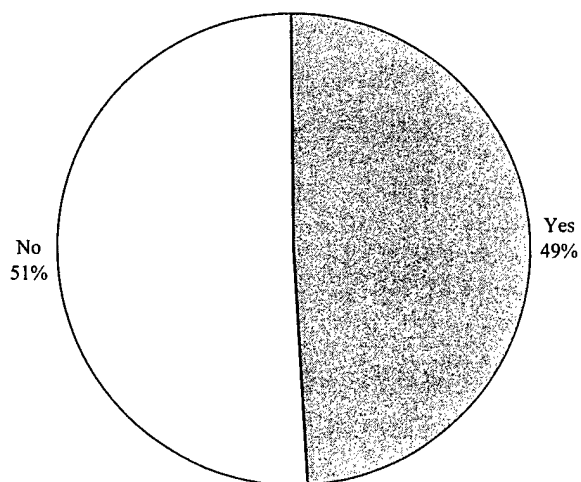
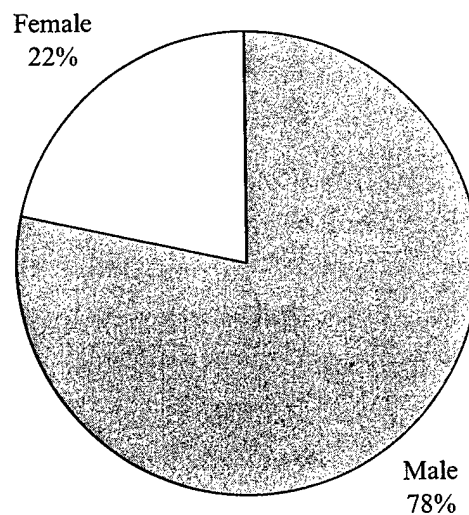


Figure 5: Percent of Participants Who Are Meal Card holders

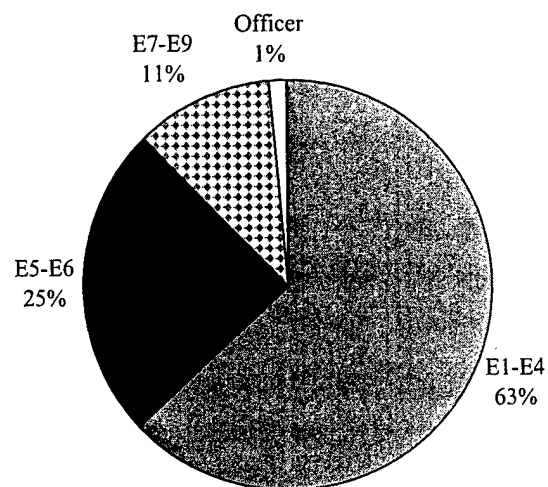
The participants gender was also tracked; 78.4 percent of respondents were male and 21.6 percent were female (Figure 6). This distribution reflects the Air Force where



19 percent of active duty members are female (Air Force Personnel Center, 2000).

Figure 6: Percent of Participants Who Were Male and Female

The rank of the participants was also recorded. However, this variable was found to be highly correlated at the  $\alpha=0.05$  (Table 5) to all other moderating variables except "italg". Therefore, this variable was not used in analysis. The reason for this correlation is probably because as one increases in age they increase in rank (the optimal career path). Also, as one increases in rank, the less likely they are to be single and living in the dorms. They would therefore not be authorized to use a meal card. The largest group of



participants was lower ranking (E1-E4); the rest participants were distributed fairly evenly among the other ranks (Figure 7).

Figure 7: Percent of Participants within Each Rank Category

Participants' general feelings about ethnic foods (Italian and Mexican) were also separated into two categories – like and not like. The majority of the participants reported they liked Mexican food (Figure 8) and Italian food (Figure 9).



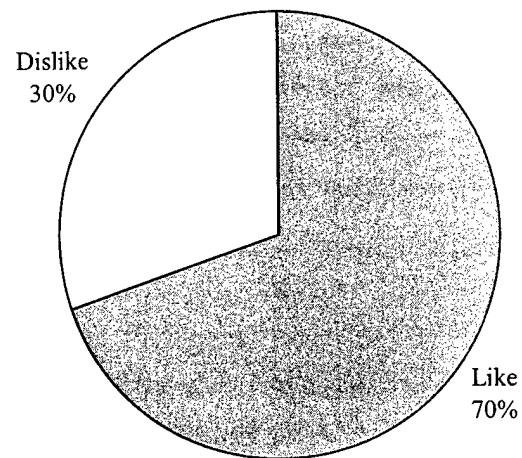


Figure 8. General Feelings toward Mexican Food by Individual Patrons

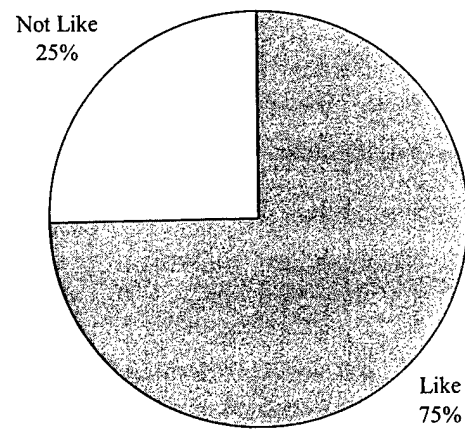
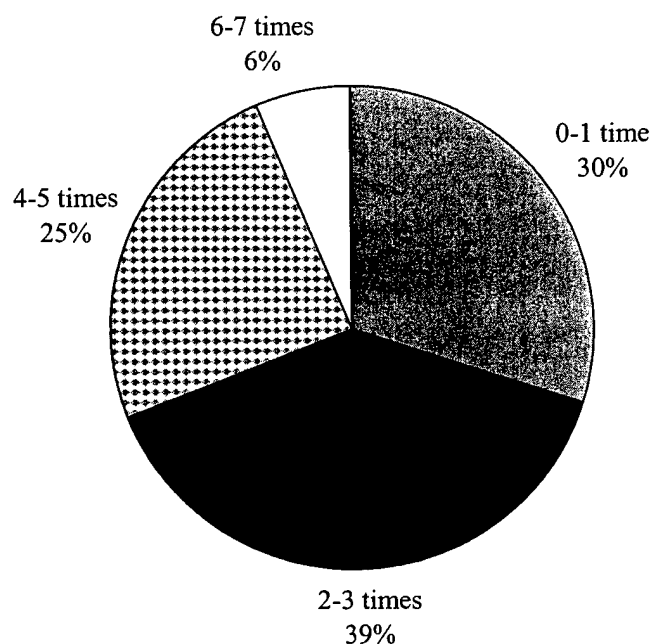


Figure 9. General Feelings toward Italian Food by Individual Patrons

The senior leadership of the installation dining facility requested the researcher also track the estimated frequencies of eating lunch at each of their dining facilities. This information is helpful in determining loyalty to an individual dining facility and forecasting (Figure 10). The majority of the participants stated they ate at the Crosswinds facility up to three times a week, very few customers estimated eating at the facility

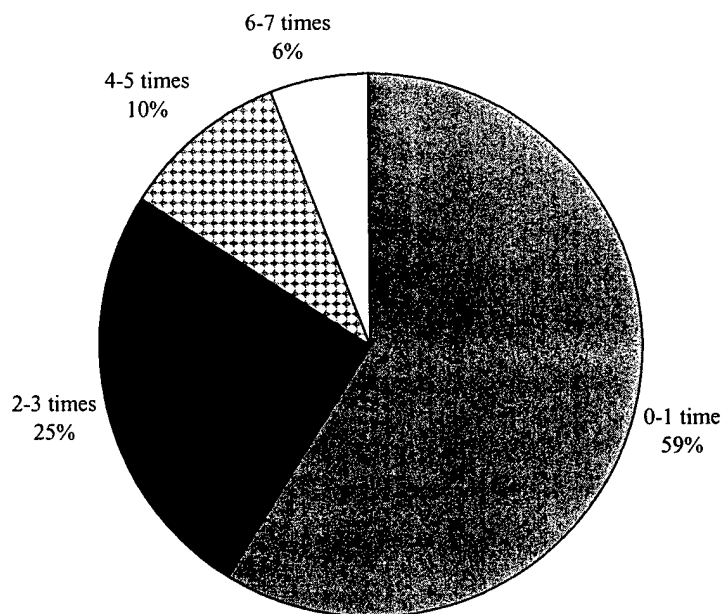


between six and seven times a week.

**Figure 10:** Estimated Frequency of Participants Lunchtime Visits to the Crosswinds Dining Facility Each Week.

When estimating frequency of visits to the Mountain View Dining Facility, the majority of the participants estimated their lunchtime visits to be one visit or less per week (Figure 11). The participants' infrequent visits to the Mountain View Facility lead

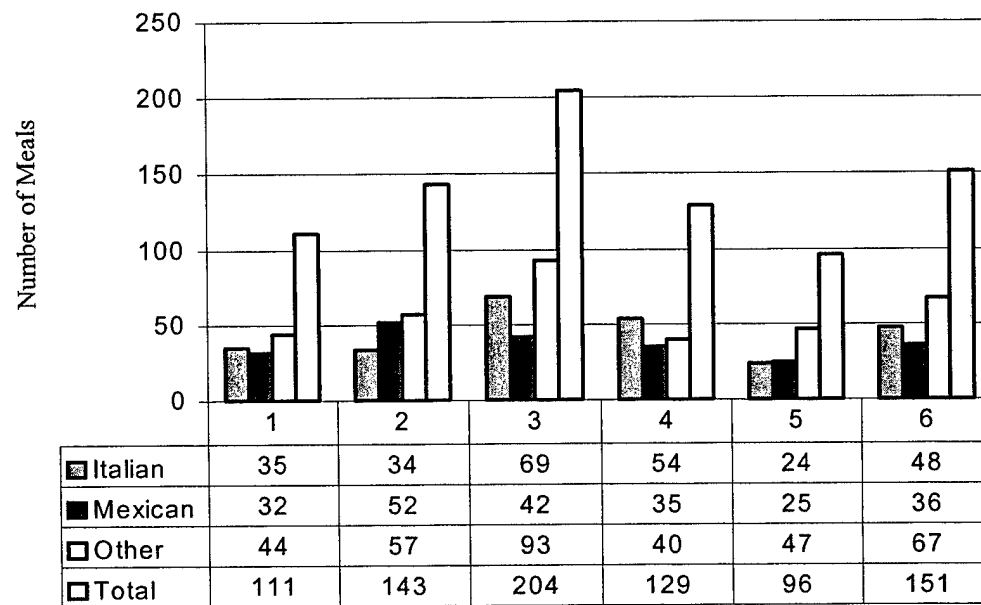
to the assumption that the customers of the Crosswinds Facility are loyal to that facility. The low responses for the 6-7 times category can be attributed to weekends. It is possible that fewer personnel eat at the dining facilities on the weekends. Statements made by the dining facility manager confirmed this, as a result, the experiment periods only fell on weekdays to ensure an adequate number of participants.



**Figure 11:** Estimated Frequency of Participants Lunchtime Visits to the Mountain View Dining Facility Each Week

Over the course of the study, 264 Italian, 222 Mexican, and 348 'other' entrées were sold (Figure 12). A possible reason for a larger number of other entrées being sold could be because more items were available in that category and only two were available

in each of the ethnic categories. The descriptive statistics were also run on entrée selection by experimental day. During day one, October 5, 2000, 111 participants (13.3%) ate in the dining facility, 31.5% ate Italian, 28.8% ate Mexican, and 39.6% ate other. During day two, October 10, 2000, 143 (17.1%) participants ate in the dining facility, 23.8% ate Italian, 36.4% ate Mexican and 39.9% ate other. During day three, October 13, 2000, 204 (24.5%) participants ate in the dining facility, 33.8% ate Italian, 20.6% ate Mexican and 45.6% ate other. On day three, the second dining facility was closed, which explains the large increase in the number of participants. During day four, October 17, 2000, 129 (15.5%) participants ate in the dining facility, 41.9% ate Italian, 27.1% ate Mexican and 31.0% ate other. During day five, October 20, 2000, 96 (11.5%) participants ate in the dining facility, 25% ate Italian, 26% ate Mexican and 49% ate other. During days four and five there was a base exercise, this attributed to the decrease in patronage to the facility. A base exercise is where a large number of base personnel work long hours in simulation of the base going to war. During day six, October 23, 2000, 151 (18.1%) participants ate in the dining facility, 31.8% ate Italian, 23.8% ate Mexican and 44.4% ate other.



**Figure 12.** Entrées Sold During Each of the Experiment Periods

In summary, the majority of the customers were male airman (E1-E4) between the ages of 18 to 23, generally liked both Italian and Mexican food, and ate at the facilities less than three times a week. The demographics of the participants limit the generalizability of the study to other food service organizations.

### Formal Hypothesis Testing

The three research questions described in Chapter I and III were converted into three research hypotheses.

1. Does a specific ethnic music genre significantly affect patrons' selection of an associated ethnic menu item in a military dining facility?

$H_0$ : Specific ethnic music genre has no significant effect on patrons' selection of an associated ethnic menu item in a military dining facility.

$H_a$ : Specific ethnic music genre has a significant effect on patrons' selection of an associated ethnic menu item in a military dining facility.

2. Do specific levels of intensity of an ethnic music genre significantly affect patrons' selection of an associated ethnic menu item in a military dining facility?

$H_o$ : Specific levels of music intensity of an ethnic music genre have no significant effect on patrons' selection of an associated ethnic menu item in a military dining facility.

$H_a$ : Specific levels of music intensity of an ethnic music genre have a significant effect on patrons' selection of an associated ethnic menu item in a military dining facility.

3. Are there any demographic traits or preferences of patrons that significantly affect their ethnic menu item selection?

$H_o$ : The moderating variables assessed have no significant effect on patrons' ethnic menu item selection.

$H_a$ : The moderating variables assessed have a significant effect on patrons' ethnic menu item selection.

### Data Analysis

The data was analyzed using both SPSS (SPSS Inc., 2000) and Minitab (Minitab Inc., 2000) computer software packages. The Minitab software was used for analysis with Italian entrée as the reference variable because this was not possible using SPSS software. SPSS was used for all other analysis.

Analysis was performed using multinomial logistic regression (MLR). MLR is an appropriate technique that “estimates the probability of a certain event occurring” (Garson, 2000, para. 1). Logistic regression calculates the changes in the log odds of the dependent variable, not changes in the dependent variable itself (Garson, 2000). In logistic regression, linearity of a relationship is not assumed to exist between the independent and dependent variables, nor does it require a normal distribution of variables, or assume homoscedasticity. Homoscedasticity is the assumption that the variance around the regression line is the same for all values of the independent variables (Lane, 2000).

#### Hypothesis One

H1<sub>o</sub>: Specific ethnic music genre has no significant effect on patrons’ selection of an associated ethnic menu item in a military dining facility.

H1<sub>a</sub>: Specific ethnic music genre has a significant effect on patrons’ selection of an associated ethnic menu item in a military dining facility.

The first step in multinomial logistic regression is to evaluate the goodness-of-fit model. This model evaluates the null hypothesis whether the probability of selecting an entrée (Italian, Mexican and non-ethnic) is the same at  $\alpha=0.05$  (Table 6). The high p-values ( $p=0.528$  &  $p=0.530$ ) provide evidence to support the claim that there is no significant difference in the menu choices and the model fits well. In short, the probability of an individual selecting each entrée is the same.

Table 6:  
The Results of the Goodness-of-Fit for Genre and Intensity on Entrée Selection Using Multinomial Logistic Regression

	Chi-Square	df	Sig.
Pearson	1.278	2	.528
Deviance	1.271	2	.530

It was hypothesized that the music genre would increase the patrons' selection of ethnic menu items at the  $\alpha=0.05$  significance level. The likelihood ratio test is significant for music genre (Table 7). The p-value = 0.011, therefore the null hypothesis of no music genre effect was rejected. Music genre has an effect on the menu choice.

Table 7:  
The Results of the Likelihood Ratio Test for Genre and Intensity on Entrée Selection Using Multinomial Logistic Regression

Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	41.812	0.000	0	.
GENRE	50793	8.981	2	0.011
INTENSITY	53.326	11.514	2	0.003

Note: The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

\*  $p < 0.05$



The results of MLR support this hypothesis. The model is based on the probability of choosing an Italian entree over a non-ethnic entrée and a Mexican entrée over a non-ethnic entree (Table 8). The MLR reveals that there is a significant relationship between the Italian music and selecting an Italian entrée ( $p=0.036$ ).

The  $\text{Exp}(B)$  is the terminology SPSS uses for the odds ratio. If the odds ratio is greater than one, the odds of an event occurring increases as the independent variable increases, and a ratio less than one indicates the odds of an event occurring decreases as the independent variable increases. The odds of selecting an Italian entrée instead of a non-ethnic entrée increases by 54% ( $\text{Exp}(B)=1.538$ ) when Italian music was being played then when Mexican music was being played. Further, the odds of selecting a Mexican entrée instead of a non-ethnic entrée increases by 82% ( $\text{Exp}(B)=1.821$ ) when Italian music is playing (Table 8) than when Mexican music is playing.

Table 8:  
Results of the Multinomial Logistic Regression for Music Genre on Entrée Selection<sup>a</sup>

							95% CI for Exp(B)	
Entrée		B	Std Error	df	Sig	Exp(B)	Lower Bound	Upper Bound
Italian vs. Non-ethnic	Intercept	-0.243	0.146	1	0.097			
	Italian Music	0.431	0.205	1	0.036*	1.538	1.029	2.301
	Mexican Music	0(b)		0		0.650 <sup>c</sup>		
Mexican vs. Non-ethnic	Intercept	-0.785	0.168	1	0.000			
	Italian Music	0.599	0.214	1	0.005*	1.821	1.196	2.772
	Mexican Music	0(b)		0		0.550 <sup>c</sup>		

a: Uses SPSS 10.0

b: This parameter is set to zero because it is redundant

c: The researcher calculated odds (Exp(B)) through inverse calculation:  $1/\text{Exp(B)}$

\*  $p < 0.05$

Minitab (Minitab, Inc., 2000) was used to compare entrée selection using the Italian entrée as the reference variable (Table 9). The MLR reveals that there is a significant relationship between Italian music and selection of an Italian entrée ( $p=0.036$ ). The odds of selecting a Mexican entrée over an Italian entrée increases by 54% ( $\text{Exp(B)}=1.54$ ) when Mexican music was playing then when Italian music was playing. The selection of a non-ethnic entrée over Italian entrée is not significant when ethnic music is playing. Therefore, the researcher fails to reject the null hypothesis. Analysis shows there is a relationship between ethnic music and selecting an ethnic entrée, but not necessarily an associated ethnic entrée.

Table 9:  
Results of the Multinomial Logistic Regression for Music Genre on Entrée Selection<sup>a</sup>

						95% CI for Exp(B)	
Entrée		Coef	Std Error	Sig	Odds Ratio	Lower Bound	Upper Bound
Non-ethnic vs. Italian	Constant	0.342	0.1910	0.074			
	Italian Music	0(a)			1.18 <sup>c</sup>		
	Mexican Music	-0.1684	0.2271	0.458	0.85	0.54	1.32
Mexican vs. Italian	Constant						
	Italian Music	0(a)			0.65 <sup>c</sup>		
	Mexican Music	0.4308	0.2053	0.036*	1.54	1.03	2.30

a: Uses Minitab 13

b: This parameter is set to zero because it is redundant

c: The researcher calculated odds (Exp(B)) through inverse calculation:  $1/\text{Exp}(B)$

\*  $p < 0.05$

### Hypothesis Two

H2<sub>0</sub>: Specific levels of music intensity of an ethnic music genre have no significant effect on patrons' selection of an associated ethnic menu item in a military dining facility.

H2<sub>a</sub>: Specific levels of music intensity of an ethnic music genre have a significant effect on patrons' selection of an associated ethnic menu item in a military dining facility.

It was hypothesized that the intensity of ethnic music would increase the patrons'

selection of ethnic menu items. The high p-values ( $p=0.528$  &  $p=0.530$ ) of the goodness-of-fit model (Table 6) provides evidence to support the claim that there is no significant bias in the menu choices and the model fits well. The likelihood ratio test is significant for music intensity (Table 7). The p-value = 0.003 and therefore the null hypothesis stating specific levels of intensity of an ethnic music genre have no significant effect on patrons' selection of an associated ethnic menu item was rejected. Music intensity has a significant effect on the menu choice. The results of MLR support this hypothesis. The model tests the probability of choosing Italian entrées over non-ethnic entrées and Mexican entrées over a non-ethnic entrées (Table 10) when music is present at either low or medium intensity. The odds of selecting an Italian entrée over a non-ethnic entrée increase by 79% ( $1/0.559$ ) when medium intensity music is playing then when low intensity music is playing. However, the relationship between music intensity and selecting a Mexican entrée instead of non-ethnic entrée is not significant ( $p=0.533$ ) (Table 10).

Table 10:  
Results of the Multinomial Logistic Regression for Music Intensity on Entrée Selection<sup>a</sup>

Entrée		B	Std Error	df	Sig	Exp(B)	95% CI for Exp(B)	
Italian vs. Non-Ethnic	Intercept						Lower Bound	Upper Bound
	Low Intensity	-0.582	0.212	1	0.006*	0.559	0.369	0.847
	Med Intensity	0(b)		0		1.789 <sup>c</sup>		
Mexican vs. Non-Ethnic	Intercept	-0.785	0.168	1	0.000			
	Low Intensity	0.134	0.214	1	0.533	1.143	0.751	1.739
	Med Intensity	0(b)		0		0.875 <sup>c</sup>		

a: Uses SPSS 10.0

b: This parameter is set to zero because it is redundant

c: The researcher calculated the odds (Exp(B)) through inverse calculation:  $1/\text{Exp}(B)$

\*  $p < 0.05$

The MLR reveals that there is a significant relationship between music intensity and the selection of a Mexican entrée over an Italian entrée ( $p=0.002$ ). The odds of selecting a Mexican entrée over an Italian entrée double ( $\text{Exp}(B)=2.041$ ) when low intensity music is playing then when medium intensity music is playing. There is also a significant relationship between medium intensity music and selecting a non-ethnic entrée over an Italian entrée ( $p=0.006$ ) (Table 11). The odds of selecting a non-ethnic entrée over Italian increase by 79% when music is played at a low intensity then when medium intensity music was played. In summary, the playing of ethnic music at a low increased the probability of selecting an Italian entrée over a non-ethnic entrée, and selecting a Mexican entrée over an Italian entrée. The different music intensity music had no significant effect on patrons' purchase of Mexican entrées over non-ethnic entrées.

Table 11:  
Results of the Multinomial Logistic Regression for Music Intensity on Entrée Selection<sup>a</sup>

Entrée		Coef	Std Error	Sig	Odds Ratio	95% CI for Exp(B)	
						Lower Bound	Upper Bound
Mexican vs. Italian	Constant	0.3418	0.1911	0.074			
	Low Intensity	0(b)			2.041 <sup>c</sup>		
	Med Intensity	-0.7154	0.2317	0.002*	0.49	0.31	0.77
Non-Ethnic vs. Italian	Constant	0.3943	0.1847	0.033			
	Low Intensity	0(b)			1.786 <sup>c</sup>		
	Med Intensity	-0.5818	0.2122	0.006*	0.56	0.37	0.85

a: Uses Minitab 13

b: This parameter is set to zero because it is redundant

c: The researcher calculated the odds (Exp(B)) for med intensity through inverse calculation:  $1/\text{Exp(B)}$  (low intensity)

\*  $p < 0.05$

### Hypothesis Three

H3<sub>o</sub>: The moderating variables assessed have no significant effect on patrons' ethnic menu item selection.

H3<sub>a</sub>: The moderating variables assessed have a significant effect on patrons' ethnic menu item selection.

All independent moderating variables were analyzed and the significant ones are discussed. The high p-values ( $p=0.131$  &  $p=0.063$ ) of the goodness-of-fit statistics test provide evidence to support the claim that there is no significant bias in the menu choices; the probability of an individual selecting each entrée is the same (Table 12).

Table 12:  
The Results of the Goodness-of-Fit Test for Age, Genre, Intensity, Gender, "mexg" and "italg" on Entrée Selection using Multinomial Logistic Regression

	Chi-Square	df	Sig.
Pearson	163.533	162	0.451
Deviance	182.147	162	0.133

It was hypothesized that there would not be a significant relationship between moderating variables and ethnic menu item selection at the  $\alpha=0.05$  significance level. The likelihood ratio test is significant (Table 13). Therefore, the null hypothesis that moderating variables have no significant effect on patrons' ethnic menu item selection was rejected.

Table 13:

The Results of the Likelihood Ratio Test for Age, Genre, Intensity, Gender, "mexg" and "italg" on Entrée Selection using Multinomial Logistic Regression

Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	377.056	0.000	0	.
AGE	386.388	9.332	2	0.009*
GENRE	384.628	7.572	2	0.023*
INTENSITY	389.437	12.380	2	0.002*
GENDER	382.197	5.141	2	0.077
MEXG	397.134	20.078	2	0.000*
ITALG	393.024	15.968	2	0.000*

Note: The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

\*  $p < 0.05$

MLR was used to analyze the relationship between age, gender, and general feelings for Mexican and Italian food with entrée selection (Table 14). The first set of logits estimate the probability of Italian entrée selection over the reference event, non-ethnic entrée. The p-value of 0.002 for general liking of Italian food is significant. Therefore, the odds of selecting an Italian entrée over a non-ethnic entrée increases by 42% ( $\text{Exp}(B)=1.423$ ) when a patron likes Italian food then when the patron does not like Italian food. There is insufficient evidence to conclude that any of the other independent moderating variables are significant in the selection of an Italian entrée over a non-ethnic entrée then when they do not like Italian food.



The second set of logits estimate the probability of Mexican entrée selection over the reference event, non-ethnic entrée (Table 14). The p-values of 0.002 indicates that there is sufficient evidence to conclude that as the patrons' age increases, the probability of their choosing a Mexican entrée over a non-ethnic entrée increases by 35% ( $\text{Exp}(B)=1.354$ ). Also, the p-value of 0.031 for males indicates there is sufficient evidence to conclude that males are 93% ( $\text{Exp}(B)=1.937$ ) more likely to order a Mexican entrée over a non-ethnic entrée than females. Finally, the p-value of 0.001 for the general liking of Mexican food is significant. Therefore, the odds of selecting a Mexican entrée over a non-ethnic entrée almost triples ( $\text{Exp}(B)=2.874$ ) when the patron likes Mexican food then when they do not like Mexican food.

In summary, general liking of Italian food significant affects the selection of Italian food over non-ethnic food. Further, age, gender, and general liking of Mexican food all significantly affect the selection of Mexican food over non-ethnic food.

Table 14:  
Results of the Multinomial Regression for Age and Gender on Entrée Selection<sup>a</sup> Using Multinomial Logistic Regression

Entrée		B	Std. Error	df	Sig.	Exp(B)	95% CI for Exp(B)	
							Lower Bound	Upper Bound
Italian vs. Non-Ethnic	Intercept	-1.111	0.334	1	0.001			
	Age	0.133	0.097	1	0.172	1.142	0.944	1.381
	Italian Music	0.384	0.209	1	0.067	1.468	0.974	2.212
	Mexican Music	0(b)		0		0.681 <sup>c</sup>		
	Low Intensity	-0.603	0.215	1	0.005*	0.547	0.359	0.835
	Med Intensity	0(b)		0		1.828 <sup>c</sup>		
	Male	8.844E-02	0.254	1	0.728	1.092	0.664	1.797
	Female	0(b)		0		0.916 <sup>c</sup>		
	Like "mexg"	-0.264	0.257	1	0.303	0.768	0.464	1.270
	Not like "mexg"	0(b)		0		1.302 <sup>c</sup>		
	Like "italg"	0.958	0.309	1	0.002*	2.606	1.423	4.771
	Not like "italg"	0(b)		0		0.384 <sup>c</sup>		
Mexican vs. Non-Ethnic	Intercept	-2.473	0.402	1	0.000			
	Age	0.303	0.100	1	0.002*	1.354	1.114	1.646
	Italian Music	0.582	0.223	1	0.009*	1.789	1.156	2.770
	Mexican Music	0(b)		0		0.559 <sup>c</sup>		
	Low Intensity	0.160	0.221	1	0.470	1.173	0.761	1.810
	Med Intensity	0(b)		0		0.853 <sup>c</sup>		
	Male	0.661	0.307	1	0.031*	1.937	1.061	3.537
	Female	0(b)		0		0.516 <sup>c</sup>		
	Like "mexg"	1.056	0.305	1	0.001*	2.874	1.581	5.223
	Not like "mexg"	0(b)		0		0.348 <sup>c</sup>		
	Like "italg"	-0.334	0.305	1	0.275	0.716	0.394	1.303
	Not like "italg"			0		1.397 <sup>c</sup>		

a: Uses SPSS 10.0

b: This parameter is set to zero because it is redundant

c: The researcher calculated the odds (Exp(B)) through inverse calculation:  $1/\text{Exp}(B)$

\*  $p < 0.05$

### Summary of the Findings

Three hypotheses were tested to determine whether music genre, music intensity, or moderating variables have an effect on menu item selection. Hypothesis one focused on music genre and its relationship to the selection an ethnic entrée. Music genre was found to have a significant effect on selection of a Mexican or an Italian entrée over non-ethnic entrées, but not an associated ethnic entrée so the researcher failed to reject the null hypothesis. Further analysis revealed that Italian music was the only genre to have a significant effect on the selection of both Mexican and Italian entrées over non-ethnic entrées.

Hypothesis two focused on music intensity and its relationship to the selection of an ethnic entrée. The null hypothesis was rejected because music intensity was found to have a significant effect on the selection of an ethnic entrée over a non-ethnic entree. Upon further analysis, medium intensity music was found to increase the odds of selecting an Italian entrée over Mexican food and non-ethnic food then low intensity music. A significant relationship was not found between the intensity of Mexican music and Mexican entrée selection.

Hypothesis three focused on the affect that moderating variables have on ethnic menu item selection. The null hypothesis was rejected. The variables "age", "gender", "mexg", and "italg", were all found to have a significant effect on ethnic menu item selection.

The results from the survey for the three hypotheses have been presented. The next chapter will discuss the conclusions, implications, and recommendations from these results.

## CHAPTER V

### SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

#### Introduction

Background music has been studied in many venues, but limited research has been conducted on ethnic music and its effect on purchase behavior, specifically, menu item selection. This study focused on the effect music genre and intensity have on associated menu items. Moderating variables were also analyzed to determine how homogeneous groups of groups of participants might respond to the study. The effect moderating variables have on menu item selection with the presence of music at a specific genre and intensity was also studied. The results of a study cannot be generalized to populations outside of the military.

#### Summary of Key Findings

In examining phase one of the analysis, it was determined music genre had a significant impact on menu item selection ( $p=0.011$ ). Patrons were significantly more likely to select Italian ( $p=0.036$ ) and Mexican ( $p=0.005$ ) items over 'other' when Italian music was being played then when Mexican music was being played – Mexican music had no significant effect ( $p=0.458$ ). The playing of ethnic music increased the probability of selecting an ethnic entrée, but not necessarily the associated entrée.

In examining phase two of the analysis, it was determined music intensity had a significant impact on menu item selection ( $p=0.003$ ). Music at a medium intensity had a significant effect on the selection of an Italian entrée over a Mexican entrée ( $p=0.006$ ) and over 'other' ( $p=0.036$ ) then music at a low intensity. Music intensity was not found to be significant for selecting Mexican over 'other' ( $p=0.533$ ).

The final phase of the analysis evaluated the relationship between the moderating variables and entrée selection. The age, gender, card, "mexg", and "italg" variables all had a significant effect on menu item selection. The analysis of the relationship of age revealed as patrons got older, they were more likely to select a Mexican entrée over 'other' ( $p=0.002$ ). Males were significantly more likely to order Mexican food over 'other' ( $p=0.031$ ) then females. Finally, the general liking of Mexican food or Italian food was significantly related to the purchase of the associated menu item.

### Discussion

The foodservice environment is a prime environment to add background music as a part of the existing atmosphere. Music can have a significant impact on customers' behavior. The military dining facility used in the experiment is a small example of where music might be implemented at varying genres in order to enhance the purchase of one item over another. This has practical applications to the real world with the popularity of theme restaurants and daily or weekly specials. A manager might also find it necessary to sell a large amount of a specific menu item before it becomes waste. If that item is an ethnic item, playing ethnic music is, according to this study, an optimum way to increase the sale of ethnic menu items.

This study does not provide evidence that all genres of music have a positive effect on the sale of ethnic menu items. It does not provide managers with the specific music genres or intensities that must be played to optimize sales, nor does it provide an explanation of why customers responded to the music genre and intensity as they did.

The most interesting results of the study came from the significant effect Italian music had on the selection of Mexican and Italian entrées over non-ethnic entrées. Surprisingly, Mexican music did not have a significant effect on the selection of Mexican entrées. This may be due to the music genre. Although both music styles were similar in tempo, the Italian music was traditional and the Mexican music was popular Latin, Salsa and Merengue. The traditional Italian music was indicative to what might be playing in the background at popular Italian restaurants. This could have instantly caused people to want to purchase ethnic food. The focus group felt strongly about the use of traditional Italian music, and voted against the use of modern Italian music. The focus group did not feel modern Italian music evoked images of Italy. Latin music has become very popular in social settings and is often played in the dance clubs. The majority of the patrons involved in the survey were under 24 years old; therefore, they may be more exposed to Latin music through the dance clubs and, due to their familiarity with it, are less aware of its presence.

These findings support the researchers belief that music genre and intensity, as well as patrons individual characteristics and preferences, have a significant impact on their purchase behavior in a foodservice environment.

The researcher did not evaluate music preferences in conjunction to evaluating ethnic food preferences due to the Hawthorn effect. Originally, the researcher included

questions on music preference, which was similar to previous studies. However, after considerable thought, it was decided that since many of the customers would be repeat customers they may easily associate the music with the study. The previous studies (Milliman, 1986, Yalch & Spangenberg, 1990) did not deal with repeat customers and the surveys were completed upon patrons exit of the experimental environment, therefore the Hawthorn effect was avoided. Even without the questions dealing with music preference, five customers stated that they were aware, after a couple of visits, that music was only present when the researcher was present. On non-experiment days, the dining facility did not play music in the background, this explains why patrons associated the music with the research.

### Conclusions

All of these findings support earlier research showing the atmosphere of a sales environment (retail sales, foodservice, grocery) have an effect on the behavior of the patrons of these establishments. This research further supports the Mehrabian-Russel model that was adopted for this research. The environmental stimulus was shown to create a response from customers, which was influenced by moderating variables. This response created either an approach or an avoidance behavior. Although the music did not always significantly affect the purchase of an associated ethnic entrée, it did have a significant effect on the purchase of an ethnic entrée in general.

### Implications of the Study

This study was undertaken because of the investigator's belief that atmospherics have a great deal of impact on the behavior of customers, specifically music. The researcher also believed that the genre of music, could have a significant impact on foodservice customers, and this knowledge could assist managers in planning specialty meals and forecasting sales. The atmosphere of a sales environment must be congruent with the intentions of that establishment and the sales may be not optimized if they do match.

With the understanding of how music genre and intensity affect the purchase behavior of patrons, management has empirical data to use in optimizing their sales establishment. Therefore, the extra time a manager takes when selecting background music can result in increased sales of a particular item. The manager also needs to evaluate their target market to ensure the music genre and intensity chosen for the establishment is a match to that age group.

This information will be helpful to military dining facility managers in staying within the two percent profit/loss margin. If the facility is losing too much money, the manager can serve inexpensive Mexican entrées made with ground beef and use background music to increase the purchase of these items. The reverse is also possible. If the facility is making too much money, the facility could serve more expensive veal parmigiana and play background music to drive patrons to purchase the more expensive meal. Also, background music could be used to decrease the variability in sales, which is helpful in forecasting.



### Recommendations for Future Research

1. Further demographics should be gathered to identify whether ethnicity of the customer has a significant effect on purchase decisions, after the appropriate music genre and intensity has been introduced.
2. This study should be replicated at more facilities across the armed forces. It should also be replicated in commercial and institutional sectors.
3. A study should be conducted that also analyzes the relationship between no music and the presence of ethnic music on ethnic entrée selection.
4. A study could be conducted to determine whether the types of instruments used in the specific music genres have varying effects on patrons' moods, which in turn effect their entrée selection.
5. A future study should be done to evaluate the effect of music genre, intensity and tempo on menu item selection.
6. A study should be conducted to evaluate customers' ethnic music preference in relation to their ethnic menu item selection.
7. A study should be conducted evaluating the effect of other ethnic music genres, besides Italian and Mexican, on associated ethnic menu item selection.

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# APPENDIX A

## Recipe Cards to Prepare the Ethnic Meals and the Short Order Special

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### L025 LASAGNA

YIELD: 100		EACH PORTION: 1 PIECE	
PAN SIZE 12BY20BY2.5" STEAM TABLE PAN		TEMPERATURE: 350 F. OVEN	
CALORIES(KCal) 332.00		COOKTIME 01:15	
FAT (g) 18.00		SODIUM (mg) 12.03	
CHOLESTEROL (mg) 12.03		RATIO 0.00	
REF RECIPES		RATIO 0.00	
Ingredients			
001	BEEF,FZ,GROUND BULK,LEAN 8905-C1-E09-8236	12 LB 0.00 OZ	0.0000 0.0000
002	VEG,DRY,ONIONS,YELLOW 8915-C1-E21-0362	4 LB 7.00 OZ	0.0000 0.0000
003	SPICE,PEPPER,BLACK,GROUND 8950-C1-419-2898	0 LB 0.20 OZ	0.0122 0.0000
004	SPICE,OREGANO,GROUND 8950-C1-420-9184	0 LB 0.75 OZ	0.0000 0.0000
005	SPICE,THYME,GROUND 8950-C1-419-2894	0 LB 0.20 OZ	1.0000 0.0000
006	SPICE,PEPPER,RED,GROUND 8950-C1-419-2891	0 LB 0.06 OZ	1.0000 0.0000
007	SPICE,GARLIC,PWDR 8950-C1-419-4927	0 LB 0.08 OZ	1.2500 0.0000
008	SPICE,BASIL,SWEET,CRUSHED 8950-C1-419-7709	0 LB 0.52 OZ	2.6700 0.0000
009	VEG,CN,TOMATOES,DCD 8915-C1-373-4978	19 LB 2.00 OZ	0.0000 0.0000
010	VEG,CN,TOMATO PASTE 8915-C1-E09-0195	7 LB 12.00 OZ	0.0000 0.0000

**Weights(AP) Measures**

1. Cook beef in its own fat until beef loses its pink color, stirring to break apart. Drain or skim off excess fat. Add onions; saute 3 minutes.

2. Add pepper, oregano, thyme, red pepper, garlic and basil; cook 5 minutes longer.

3. Add tomatoes and tomato paste to meat mixture. Blend well; simmer 1 hour. Skim off excess fat. Set aside for use in Step 5.

4. Combine liquid eggs, cheeses, and parsley. Mix well; place in shallow pans; refrigerate for use in Step 5.

5. Follow panning instructions.

6. Cover. Bake 1 hour. Uncover; bake 10 to 15 minutes.

7. Cut and serve immediately.

**PANNING INSTRUCTIONS:** Arrange in layers in each pan.

**NOTE:** During panning, remove small amounts of filling from refrigeration at a time. Ensure entire panning procedure does not exceed 3 hours total time between temperatures of 40 F. to 140 F.

LAYER: 1. 3 cups meat sauce  
LAYER: 2. Noodles, flat and in rows  
LAYER: 3. 1 qt chilled filling  
LAYER: 4. 1 qt meat sauce  
LAYER: 5. Noodles, flat and in rows  
LAYER: 6. 1 qt chilled filling  
LAYER: 7. Noodles, flat and in rows  
LAYER: 8. 1 1/2 qt meat sauce

Sprinkle with Parmesan cheese. Follow Steps 6 and 7. Cut 5 by 4.

**NOTE:** 1. In Step 1, 4 lb 7 oz dry onions. A.P. will yield 4 lb chopped onions.



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## LASAGNA

L025

011	CHEESE,COTTAGE,LOWFAT,1% 8910-C0-126-3406	11 LB 0.00 OZ	0.0000 0.0000	2. In Step 1, 8 oz (2 2/3 cups) dehydrated onions may be used. See Recipe No. A-11.
012	CHEESE,PARMESAN/OR ROMANO,GRATED 8910-C0-782-3765	1 LB 0.00 OZ	0.0000 0.0000	3. In Step 2, 1 2/3 tbsp (5 cloves) minced dry garlic may be used. Fry with onions.
013	CHEESE,MOZZARELLA,NTRL 8910-C0-782-2837	3 LB 12.00 OZ	0.0000 0.0000	4. In Step 3, 7 lb 14 oz (3 1/2-36 oz cn) canned tomato juice concentrate may be used.
014	SPICE,PARSLEY,DEH,FLAKES 8950-C1-E19-0493	0 LB 1.17 OZ	6.0000 0.0000	5. 5 lb 2 oz (1 1/4-No. 10 cn) canned pizza blend cheese may be used for all Parmesan and Mozzarella cheeses in recipe. Use only in panning.
015	PASTA,LASAGNA,CURLY/FLAT 8920-C1-E09-2783	6 LB 0.00 OZ	0.0000 0.0000	6. In Step 6, if convection oven is used, bake at 300 F. 1 hour on high fan, closed vent. Uncover; bake 10 to 15 minutes.
016	CHEESE,PARMESAN/OR ROMANO,GRATED 8910-C0-782-3765	0 LB 6.00 OZ	0.0000 0.0000	
017	EGG PRODUCT,LIQ,REDUCED CHOLESTEROL,FZ 8910-C1-E19-0835	3 LB 0.00 OZ	1.5000 0.0000	

TB

QT

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## L103 VEAL PARMESAN

YIELD: 100		EACH PORTION: 1 STEAK		METHOD	
PAN SIZE 18 X 26" SHEET PAN		TEMPERATURE: 425 F. OVEN: 375			
CALORIES(Kcal)	FAT (g)	CHOLESTEROL (mg)	SODIUM (mg)	COOKTIME	
				00:45	
REF RECIPES	0015	RATIO 1.00	RATIO 0.00	RATIO 0.00	
Ingredients			Weights(AP)		
			Measures		
001	VEAL STEAK, FLAKED, FRMD, BD, FZ 8905-C0-139-8481		37 LB 8.00 OZ	0.0000 0.0000	
002	CHEESE, MOZZARELLA, NTRL 8910-C0-782-2837		3 LB 2.00 OZ	0.0000 0.0000	
003	CHEESE, PARMESAN/OR ROMANO, GRATED 8910-C0-782-3765		0 LB 8.00 OZ	0.0000 0.0000	

1. Prepare 1 recipe Tomato Sauce (Recipe No.O-15). Set aside for use in Step 4.

2. Place steaks on pans. Bake at 425F. 20 minutes. Turn steaks. Bake 15 minutes or until thoroughly heated and browned.

3. Cut slices in half. Place 1/2 slice cheese on each steak.

4. Pour 2 lb 11 oz(1 1/4qt)sauce over steaks in each pan.

5. Sprinkle about 6 tbsp cheese over steaks in each pan.

6. Bake at 375F. 10 minutes or until cheese is melted.

NOTE: 1. In Step 1, 10 lb 14 oz (1 2/3-No.10 cn) canned pizza sauce may be used.

2. In Step 2, if convection oven is used, bake at 400F 10 minutes. Turn steaks. Bake 6 to 8 minutes or until thoroughly heated and browned on high fan, closed vent. In Step 6, bake 325F. 6 to 8 minutes or until cheese is melted on high fan closed vent.

3. Other sizes and types of pans may be used. See Recipe No.A-25.

## L221 CHICKEN ENCHILADAS \*

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YIELD: 100		EACH PORTION: 1 ENCHILADA	
PAN SIZE: OVEN		TEMPERATURE: 350 DEGREE	
CALORIES(KCal)	FAT (g)	CHOLESTEROL (mg)	SODIUM (mg)
340	8.26	44.05,000	484
COOKTIME			
00:12			
REF RECIPES:		RATIO 0.00	RATIO 0.00
Ingredients		Weights(AP)	
		Measures	
001	CHICKEN,RTS,DICED,CKD,BNLS,FZ 8905-C1-376-1756	14 LB 8.00 OZ	0.0000 0.0000
002	VEG,FRESH,TOMATOES 8915-C1-E21-0419	5 LB 7.00 OZ	0.0000 0.0000
003	VEG,DRY,ONIONS,YELLOW 8915-C1-E21-0362	2 LB 2.00 OZ	0.0000 0.0000
004	BREAD,TORTILLAS,CORN 8920-C0-492-8402	0 LB 0.00 OZ	100.0000 0.0000
005	CONDIMENTS,PEPPERS,JALAPENO,WHL 8950-C0-489-0546	0 LB 12.00 OZ	0.0000 0.0000
006	SAUCE,BULK,SALSA,MILD,THICK/CHNKY 8950-C1-E09-4311	0 LB 0.00 OZ	1.5000 0.0000
007	SAUCE,BULK,SALSA,MILD,THICK/CHNKY 8950-C1-E09-4311	0 LB 0.00 OZ	1.0000 0.0000
008	CHEESE,AMERICAN,LWFT,INDV WRP,SLI 8910-C1-431-5627	3 LB 0.00 OZ	0.0000 0.0000

## METHOD

1. Shred chicken in buffalo chopper. Place in large mixing bowl. Add tomatoes, onions, jalapeno peppers and salsa. Gently toss until combined.
2. Using #12 disher, place chicken mixture onto tortilla. Spread down the center and roll. Spray 2" full-sized pan with vegetable spray. Place 8-9 filled tortillas per pan.
3. Pour 12 ounce salsa down the center of each pan. Top with 4 ounce shredded cheese. Bake in 325F. for 10 to 12 minutes or until cheese is melted and enchiladas have reached 160F. internal temperature.

NOTE: In Step 1, 5 lbs 7 ounce fresh tomatoes A.P. yields 4 lbs 14 ounce fresh tomatoes diced. 2 lbs 2 ounce fresh onions A.P. yields 1 lb 12 ounce onions, diced. 12 ounce jalapeno A.P. yields 9 ounce jalapeno, drained.

L043 BEEF FAJITAS

YIELD: 100		EACH PORTION: 2FAJZTBSALSA	
PAN SIZE		TEMPERATURE: 375 F. GRIDDLE	
CALORIES(KCal)	FAT (g)	CHOLESTEROL (mg)	SODIUM (mg)
REF RECIPES	O00701	RATIO 1.00	RATIO 0.00
Ingredients		Weights(AP)	
		Measures	
001	BEEF,FZ,RO KNUCKLE,PEELED,SEL 8905-C0-133-5886	18 LB 0.00 OZ	0.0000 0.0000
002	FRUIT,FRESH,LEMONS 8915-C1-E21-0341	1 LB 8.00 OZ	0.0000 0.0000
003	SPICE,SALT,TABLE,IODIZED 8950-C1-079-6943	0 LB 2.00 OZ	0.0000 0.0000
004	SPICE,GARLIC,PWDR 8950-C1-419-4927	0 LB 1.50 OZ	0.0000 0.0000
005	SPICE,ONION PWDR 8950-C1-420-9185	0 LB 0.67 OZ	0.0000 0.0000
006	SPICE,PEPPER,BLACK,GROUND 8950-C1-419-2898	0 LB 0.50 OZ	0.0000 0.0000
007	SPICE,CUMIN,GROUND 8950-C1-E09-1452	0 LB 0.20 OZ	1.0000 0.0000
008	SPICE,PEPPER,RED,GROUND 8950-C1-419-2891	0 LB 0.13 OZ	2.0000 0.0000
009	BREAD,TORTILLAS,FLOUR 8920-C0-080-9096	0 LB 0.00 OZ	200.0000 0.0000
010	VEG.DRY,ONIONS,YELLOW 8915-C1-E21-0362	5 LB 9.00 OZ	0.0000 0.0000

METHOD

1. Prepare 1 Recipe Salsa (Recipe No. O-25-2). Refrigerate for use in Step 8.
  2. Cut beef into 1/4 inch thin slices; cut slice into 1/4 inch strips, 2 To 3 inches long.
  3. Pour lemon juice over beef.
  4. Combine salt, garlic, onion powder, black pepper, cumin, and red pepper; sprinkle over beef; mix thoroughly; cover; marinate in refrigerator, 1 hour.
  5. Layer stacks of 4 to 5 tortillas in 1-12 by 20 by 2 1/2-inch steam at 5 lb PSI 8 to 10 minutes or until hot and pliable. Cover; keep warm for use in Step 8.
  6. Saute onions and peppers in melted shortening, salad oil or olive oil in steam-jacketed kettle or stock pot about 8 to 10 minutes or until onions are almost transparent. Keep hot for use in Step 8.
  7. Brown beef strips, turning frequently, 1 to 2 minutes on lightly greased griddle.
  8. Place 3 to 6 beef strips, (about 1 oz) and 1/2 oz (1 1/2 tbsp) onions and sweet pepper on each tortilla. Roll up.
  9. Serve with salsa.
- NOTE: 1. In Step 1, 1 recipe Taco Sauce, Recipe No. O-7 may be used for Salsa.
2. In Step 2, 1 lb 8 oz fresh lemons (6 lemons A.P.) will yield 1 cup lemon juice.
3. In Step 6, 5 lb 9 oz dry onions A.P. will yield 5 lb onion strips; 6 lb 1 oz sweet peppers A.P. will yield 5 lb sweet pepper strips.

L043

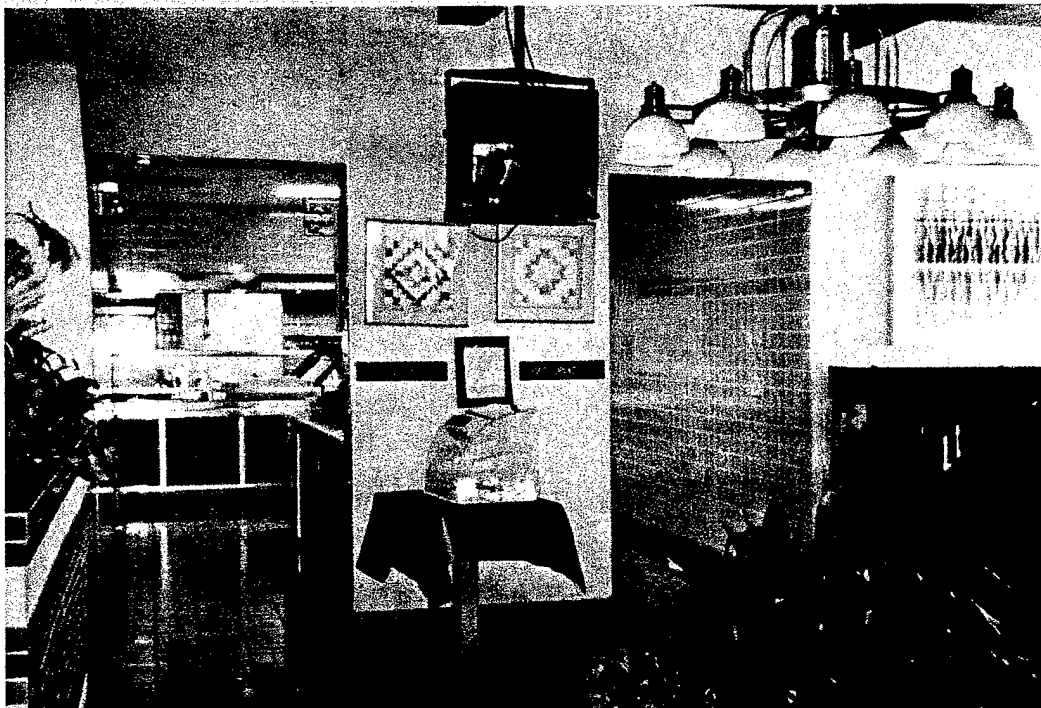
## BEEF FAJITAS

Version Date 8/10/99 Page: 2

011	VEG, FRESH, PEPPERS, SWEET, GREEN 8915-C1-E21-0381	6 LB 1.00 OZ	0.0000 0.0000	4. In Step 8 fajitas may be secured with a toothpick.
012	OIL, CANOLA 8945-C1-364-7357	0 LB 0.00 OZ	0.0313 0.0000	5. In Step 7, brown beef strips in batches of no more than 25 portions. 6. In Step 9, salsa may be placed on the serving line for self service.
013	OIL, CANOLA 8945-C1-364-7357	0 LB 0.00 OZ	0.0313 0.0000	7. In Step 9, fajitas may be served with guacamole. Prepare 1 recipe Guacamole, Recipe No. M-52. EACH PORTION: 2 Tbsp (1 Ounce).

## APPENDIX B

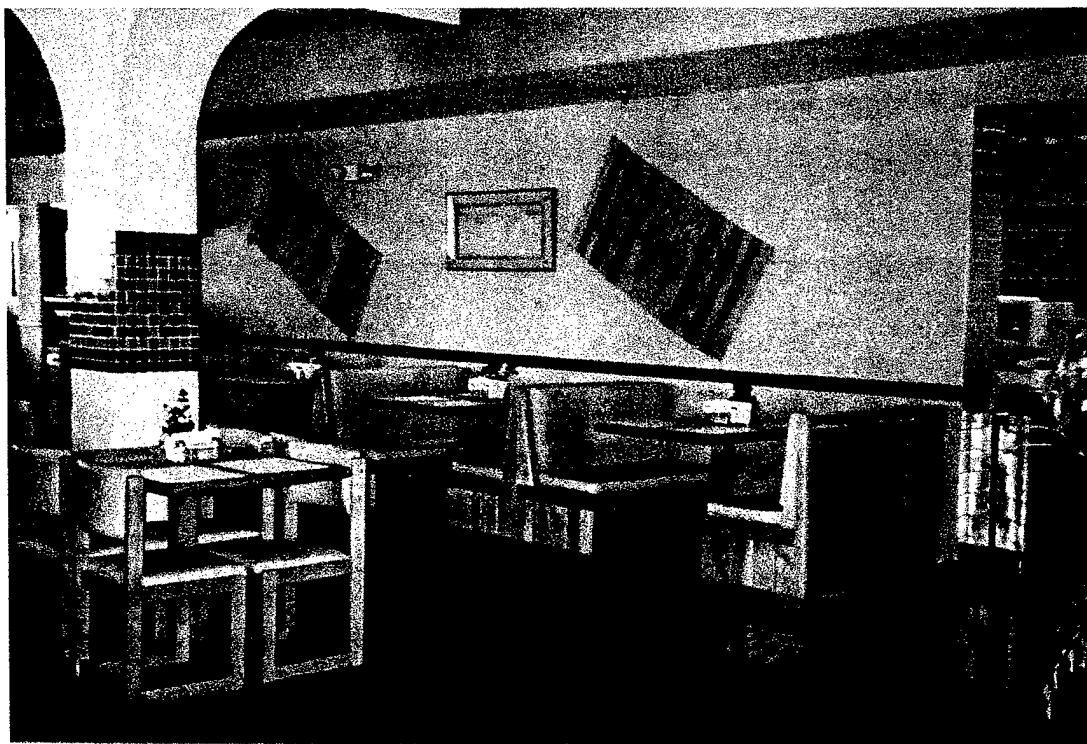
## Photos of the Interior of the Dining Facility



The researcher took the first decibel reading by the chandelier dining facility's foyer.



The researcher took the next three decibel reading along the serving line. The short order section of the serving line is in the photo's foreground and the main line is in the background.



The dining facility had a slight southwestern décor. This photo was taken near the cashiers. The researcher distributed surveys and documented entrée selections while standing to the right of the first booth.

## APPENDIX C

## Participant Informed Consent

University of Nevada, Las Vegas  
William F. Harrah College  
Of Hotel Administration

Dear Customer,

As competition grows in the restaurant industry it is important for foodservice managers to be aware of the reasons for individual menu item selection. This study will give managers research-based information for improving the sales of a particular menu item or enhancing the foodservice facility's atmosphere. Your responses on the attached survey are important in the completion of this study. This research will be conducted on varying days through the end of October 2000.

Please complete the attached questionnaire and place it in one of the boxes located on the table near the exit. The questionnaire should only take 2 minutes to complete. After you have completed the questionnaire please place it in the "completed survey" box. If you do not wish to participate in this study, please place your survey in the "incomplete survey" box.

We want to ensure you that all information will be kept confidential. The last four numbers of your social security number (SSAN) will be used only as a method of tracking the surveys return visits. We will not identify you in any way. All consent letters and surveys will be stored in a locked file cabinet and will be maintained for a period of three years.

Participation in this study is voluntary and may be discontinued at any time. If you have any questions specifically regarding the rights of research subjects, please contact UNLV's Office of Sponsored Programs at (702) 895-1357.

Thank you for your participation.  
Sincerely,

TAMMY S. HINSKTON  
Graduate Student, UNLV  
(702) 895-1795

I agree to participate in the research project described above.

---

SIGNATURE

---

DATE



## APPENDIX D

## Survey

- ☐ Lasagna      ☐ Enchiladas      ☐ Chicken      ☐ Sub/Regular Sandwich      ☐ Grilled Sandwich  
☐ Veal Parmigiana      ☐ Fajitas      ☐ Burger      ☐ Hot dog      ☐ No Main Entree

Please circle your answer or fill in the blanks

1. What are the last four digits of your social security number: \_\_\_\_\_  
 (This information is for tracking return customers only and **will not** be used for any other purpose)

2. In general, what are your feelings about: (circle the number that corresponds with your opinion)

	Love	Like	Neutral	Dislike	Hate	Have not eaten
a. Mexican Food	5	4	3	2	1	0
b. Italian Food	5	4	3	2	1	0

3. Specifically, what is your liking of this dining hall's preparation of: (circle the number that corresponds with your opinion)

	Love	Like	Neutral	Dislike	Hate	Have not eaten here
a. Mexican Food	5	4	3	2	1	0
b. Italian Food	5	4	3	2	1	0

4. On average, how often do you eat lunch in this facility each week?

- a. 0 - 1      c. 4 - 5  
 b. 2 - 3      d. 6 - 7

5. On average, how often do you eat lunch in the Mountain View Dining Facility each week?

- e. 0 - 1      g. 4 - 5  
 f. 2 - 3      h. 6 - 7

6. Are you a meal-card holder?

- a. Yes      b. No

7. What is your age?

- a. 18 - 23      d. 38 - 43  
 b. 24 - 30      e. 44 and older  
 c. 31 - 37

8. What is your gender?

- a. Male      b. Female

9. What is your rank?

- a. E1 - E4      c. E7 - E9  
 b. E5 - E6      d. Officer

## APPENDIX E



DATE: September 28, 2000

TO: Tammy Hinkston  
Food & Beverage Management  
M/S 6022

FROM: Dr. William E. Schulze, Director *William E. Schulze*  
Office of Sponsored Programs (x1357)

RE: Status of Human Subject Protocol Entitled:  
"Effects of Music on Menu Item Selection"

OSP #603s0900-105

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This memorandum is official notification that the protocol for the project referenced above has been approved by the Office of Sponsored Programs. The approval is for a period of one year from the date of this notification and work on the project may proceed.

Should the use of human subjects described in this protocol continue beyond a year from the date of this notification, it will be necessary to request an extension.

If you have any questions or require assistance, please contact the Office of Sponsored Programs at 895-1357.

cc: OSP File

Office of Sponsored Programs  
4505 Maryland Parkway • Box 451037 • Las Vegas, Nevada 89154-1037  
(702) 895-1357 • FAX (702) 895-4242

## APPENDIX F

## Daily Music Genre and Intensity

Day of Experiment	5 Oct 00	10 Oct 00	13 Oct 00	17 Oct 00	20 Oct 00	24 Oct 00
Music to be Played	N <sub>C1</sub>	I <sub>L</sub>	M <sub>M</sub>	I <sub>M</sub>	M <sub>L</sub>	N <sub>C2</sub>

N<sub>C1</sub> - First No Music Control Group

I<sub>L</sub> - Italian Music/Low Intensity

I<sub>M</sub> - Italian Music/Medium Intensity

M<sub>L</sub> - Mexican Music/Low Intensity

M<sub>M</sub> - Mexican Music/ Medium Intensity

N<sub>C2</sub> - Second No Music Control Group

Note. Music genre and intensity variations per experiment period were randomly selected by drawing the options out of a hat.

## APPENDIX G

## Focus Group Dialogue

## Attendees:

DUTY TITLE	RANK
Services Squadron Commander	Major
Combat Support Flight Commander	Captain (Capt)
Foodservice Officer	Second Lieutenant (2Lt)
Foodservice Superintendent	Master Sergeant (MSgt)
Dining Facility Manager	Technical Sergeant (TSgt)

The meeting started at 1300 hours on 27 September 2000 in a conference room on the military installation where the experiment will be conducted. The researcher summarized the study and its procedures.

A validation was conducted of the music genres as Italian or Latin. All members agreed that Latin evokes feelings for Mexican foods as much as traditional Mexican music would, except they felt Latin music was more enjoyable to be played in the military dining facility.

The first 30 seconds of 30 music selections were played. The group then determined whether the music selection evoked feelings of Italy, Mexico, or neither. They also determined whether or not they liked the music selection and wanted it played in the dining facility.

	<u>Italian (accepted)</u>	<u>Mexican (accepted)</u>	<u>Neither or didn't like (rejected)</u>
# of songs	13	12	5

The next item discussed was the informed consent and survey. No member of the focus group found either to be unclear or ambiguous. The Major, 2Lt and TSgt all stated that the best way to track entrée selection is manually. The automated process provides complete SSANs and that would bring up privacy act issues.

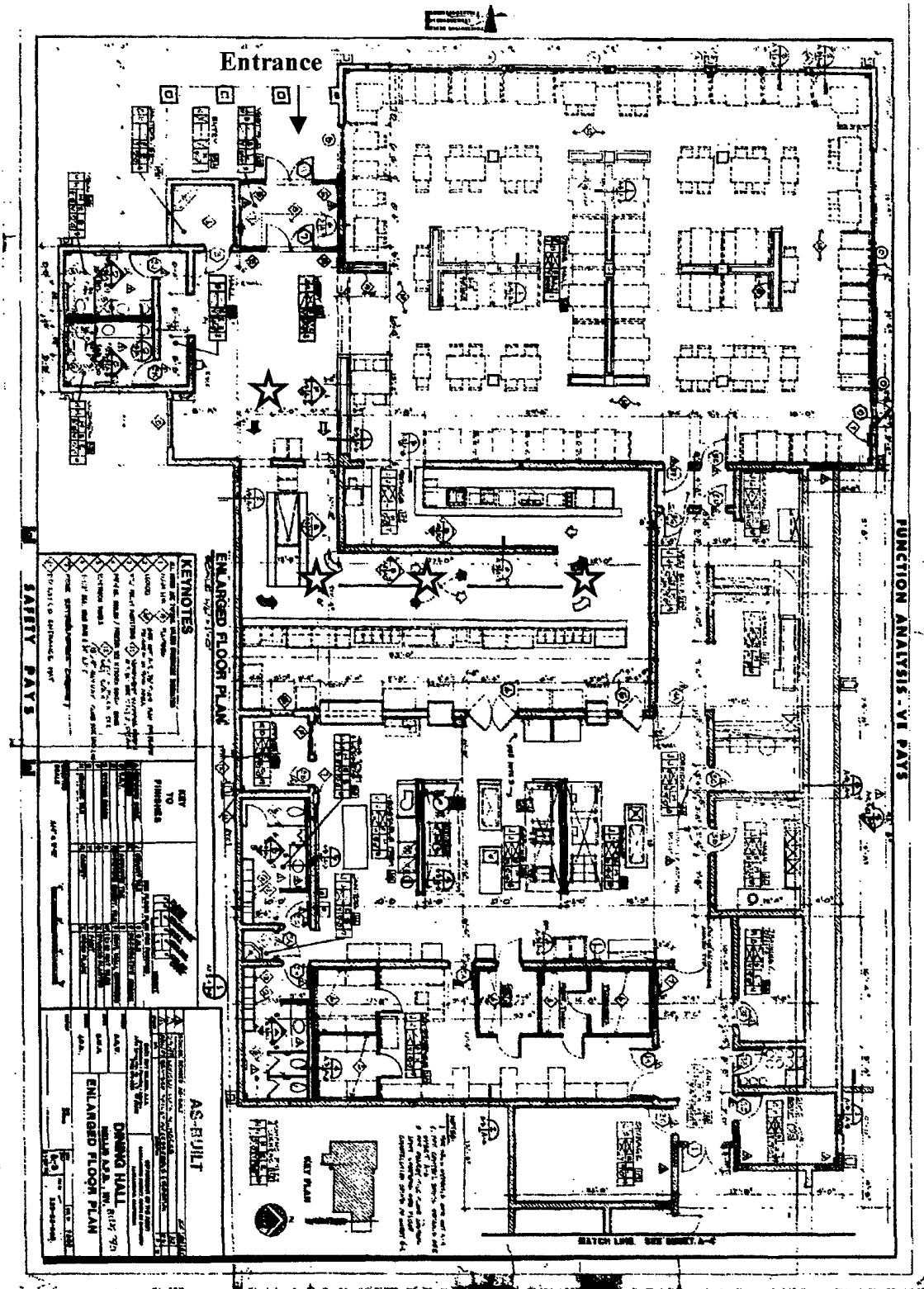
The Major questioned how a buffet line would effect the answer to questions one (which menu item was ordered) because they would have the option to get both. This led to the determination that the study would be conducted at their slightly smaller facility that offered A la Carte ordering. All members were in agreement.

The TSgt and MSgt determined the most popular Italian and Mexican entrees from the WWM were Lasagna, Veal Parmigiana, Enchiladas, and Fajitas. These items are made directly from recipe cards to limit any variation in preparation between experiment days.

The Capt requested two questions be added to assist the managers in determining customer loyalty and if rank has a significant effect on which facility customers eat in. The Major agreed with the additional questions.

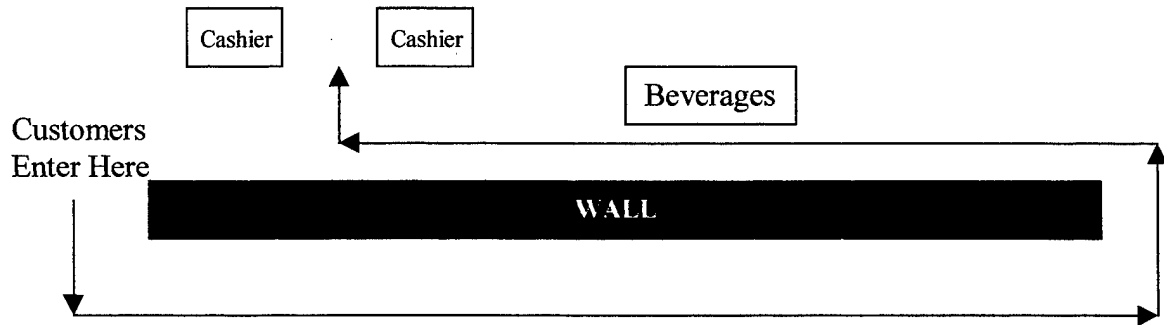
## APPENDIX H

### Floor Plan of the Crosswinds Dining Facility



★ Indicates the locations where the decibel readings were taken.

## Layout of the Serving Line



Short Order Items			Italian Entrées		Mexican Entrées	
Grill	Sandwiches		Veal Parmesan	Lasagna	Fajitas	Enchiladas

## VITA

Graduate College  
University of Nevada, Las Vegas

Tammy S. Hinskton

Local Address:

7229 Hawk Haven Street  
Las Vegas, NV 89131

Degrees:

Bachelor of Science, Human Development and Family Studies, 1995  
Colorado State University

Thesis Title: A Study of the Effect of Music Genre and Intensity on Ethnic Menu Item  
Selection in a Military Dining Facility

Thesis Examination Committee:

Chairperson, Dr. Andrew Hale Feinstein, Ph. D.  
Committee Member, Dr. Pearl Brewer, Ph. D.  
Committee Member, Dr. John Bowen, Ph. D.  
Graduate Faculty Representative, Dr. Tenured Professor, Ph. D.